



A Reply to Dr. J. E. Hinkins's Paper.*

By DR. E. C. KIRK, Philadelphia, Pa.

PART I.

In the paper by Dr. J. E. Hinkins, in the March number of *ITEMS OF INTEREST*, it appears to me that there are two distinct phases involving points of issue between the views of the essayist and my own. The first phase comprises what I think I may fairly call a bill of grievances or complaints upon the part of the essayist, for what he believes to be an injustice which I have done him in not giving him proper credit for his scientific work in certain instances and attempting to give the credit for that same work to others. The second phase of his paper as I interpret it deals with the question of the value of scientific evidence which I have brought forward in the endeavor to throw some light upon a problem in which both the essayist and myself are particularly interested, and in which the dental profession has been interested practically from the beginning of its history. I shall deal with these two phases of the subject separately, and in the order in which I have stated them.

At the outset I wish to state with all the emphasis which may be possible that if I have in any instance failed to give credit to the essayist

*A complete reply to Dr. Hinkins is in our hands, but reaches us too late to be published in full. The second part will appear next month.—Ed.

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for any work which he has done, or if I have, as he seems to think, robbed him of any portion of that credit and endeavored to give it to others, it has been done unintentionally and with absolutely no realization on my part that it had been done.

In this connection let me say that to my mind the question of who is the originator of facts that shed light upon scientific problems has always been of secondary importance to the fact that the light has been produced, for I take it that the purpose of scientific work is to discover the truth, and it would give me just as great pleasure to hail Dr. Hinkins as the discoverer of a new truth in the science of dentistry as it would to hail Dr. Miller in that capacity, or any one else, and I am sincere when I say that it would give me the same pleasure to have Dr. Hinkins make a new discovery in the science of dentistry as it would had I made the discovery myself. I ask him to believe that I should therefore be very loath to deprive him of one iota of any of the honors to which he may justly be entitled.

Comments on Hinkins' Previous Papers.

I learned at St. Louis during the sessions of the Congress that Dr. Hinkins held a grievance against me because I had failed to give him credit for the results of some of his researches, and that he proposed to mention this point in a paper which he was to read before one of the Sections, and I was advised by my informant to be present at that meeting and make an explanation. I subsequently had an interview with Dr. Hinkins, in which interview we talked somewhat of the matter of the action of acids upon the teeth, and I believe that he offered me a copy of his paper to read, and expressed a wish that I should be present to discuss it. I explained to him, however, and to Dr. Miller, who, I think, was present, the practical impossibility of my accepting his invitation owing to the fact that my executive duties at that time were claiming all of my attention, and indeed were so onerous and pressing that many of the things that I should have been glad to do in my official capacity as Secretary of the Congress were left undone, because of the physical impossibility of giving attention to all the matters which were crowded upon me at that time.

I heard no more and knew nothing more of the incident until Dr. Hinkins' paper, and the discussion upon it, came before me in an editorial way when the matter was being prepared for publication in the *Dental Cosmos* and for the official transactions. I then found that Dr. Hinkins had publicly called me to account in his St. Louis Congress paper, because in a paper read by me before the Second District Dental Society of New York in March, 1902, and published in the *ITEMS OF INTEREST* for July of the same year, I did not credit him with work done by him and

reported by him in his Paris Congress paper in 1900. He says (*Trans. IVth International Dental Congress*, page 112): "In a paper by Dr. E. C. Kirk (ITEMS OF INTEREST, July, 1902), the theory is discussed that erosions may be due to the action of lactic acid and the acid phosphates of sodium and calcium upon the tooth structure. We wish to point out that in our paper read in Paris, in 1900, we pointed out the role played by these organic acids in the failure of cements and tooth structure—and in view of this Dr. Kirk's hypothesis is not new; not only this but Dr. Kirk did not make reference to our paper on this subject, and therefore, failed to give us the credit due." (*Dental Cosmos*, vol. xlvii, page 328).

As throwing further light upon the attitude of mind of Dr. Hinkins with regard to this point, I quote from the report of Dr. Hinkins' remarks in closing the discussion upon this paper: "In conclusion, a few words to the beacon lights of our profession. Of these men, most of all, is the highest ethical standard expected. They should be ever willing to lend a helping hand to the young man in his research work, and to recognize, encourage, and refer to the articles which the younger men present to the profession. Unfortunately in the past some of our most prominent men in their papers have not given the proper credit to others for the work which they have done. As a result many young men are discouraged from engaging in research work, feeling that their investigations will not be recognized and given the proper credit and encouragement." (*Dental Cosmos*, March, 1905, page 369.)

There are two reasons why I did not refer in my ITEMS OF INTEREST paper on erosion to the paper by Dr. Hinkins and Dr. Acree, on the disintegration of cement fillings, read before the Third International Dental Congress, held in Paris, in 1900. First, because it did not occur to me after reading Dr. Hinkins' paper that it bore directly on the subject of my ITEMS OF INTEREST paper, already referred to; and, secondly, because of the nature and purpose of my ITEMS OF INTEREST paper itself.

Dr. Hinkins' statement, which I have already quoted, I interpret to mean this, that because of the conclusions reached by him as the result of his researches as reported in his Paris paper of 1900, that certain organic acids are generated in the mouth either through the agency of mouth bacteria or possibly of certain enzymes, and that these organic acids were shown by him to have a solvent action upon cements, and that very likely as he suggests they would also have a solvent action upon tooth structure, then, and therefore, I did him an injustice in not calling attention to these observations in my ITEMS OF INTEREST paper in which I reported some findings in the study which I had made of a case of dental erosion. I am very glad to have Dr. Hinkins' explanation of his

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meaning, but I submit that when he wrote the paragraph I have quoted he places the record of his ideas in such form as to distinctly lay them open to the inference which I drew therefrom. It is, however, a curious fact that although claiming priority for the hypothesis referred to he later proceeds with much pains to demolish it. I at once admit frankly that it did not occur to me from the reading of Dr. Hinkins' paper that his conclusions differed so materially from the conclusions generally held by the dental profession, as to the verity of the fact that organic acids are formed in the mouth by fermentation, and are capable of acting on tooth structure, as to make it necessary to specifically allude to the writings of any author who has attempted to solve that same problem.

Comments on Miller's Contributions.

It seemed to me that general view had been so well established that it had become common knowledge both in medicine and dentistry, and it was, therefore, under the circumstances, and in view of the character of my report of the erosion case published in the *ITEMS OF INTEREST*, not necessary to rehearse the evidence bearing on that question.

But Dr. Hinkins takes me to task for endeavoring to defraud him of the credit due him for these researches, and to place the honors for these conclusions to the credit of Dr. Miller. I am surprised that Dr. Hinkins has so completely misunderstood my motive. It is immaterial to me who is credited with this discovery. I had always believed from the time when I first made myself familiar with the researches of Miller on the etiology of dental caries involving the acids of fermentation in the human mouth that he had definitely established the fact that certain bacteria in the presence of carbohydrate food in the oral cavity generated acids by what we know as fermentative processes, that he had determined the chemical nature certainly of one, if not more of these acids of fermentation, and had further determined that decay of the teeth was mainly due to this cycle of activities. Everybody who has studied the subject admits, of course, that other observers had much to do with establishing the fact of the production of acids by fermentation in the mouth, but it has seemed to me that the essential feature of Miller's researches is the discovery of the fact that, in caries of the teeth, the decalcification of the tooth structure was brought about principally by the acids of fermentation produced by bacteria in localized areas of tooth structure, and that the acid mainly responsible for tooth decalcification in caries is lactic acid.

Miller's paper, read at the meeting of the American Dental Society of Europe, held at Ostende in August, 1882, states as its first conclusion: "The first stage of caries of the teeth, i. e., the extraction of the lime salts, is for the most part caused by those acids which are generated in the

mouth by fermentation." (*Dental Cosmos*, vol. xxv, page 11.) His subsequent papers upon fermentation in the human mouth, running through five issues of the *Independent Practitioner* for the year 1884, and much of the text of his work on "Micro-organisms of the Human Mouth" bear so directly upon the establishment of the general proposition that decalcification of the teeth, particularly in caries, is due to the acids produced through the agency of bacteria acting upon carbohydrate food materials in the mouth as to leave no doubt in my mind as to his meaning. In short, it seems to me that, by reason of his works and his published results, he is to be rightfully credited with having established that general fact.

I have never claimed for Dr. Miller, nor has he ever claimed for himself, that he has solved all of the factors that enter into the problem of the etiology of caries of the teeth, nor has he, so far as I am aware, made any claim, nor have I suggested, that he has worked out all of the fermentative processes in the mouth which may produce acid end-products. When I stated in reply to Dr. Hinkins, and this is one of the points which he critically quotes against me as evidence that I have attempted to take from him certain credit and give it to Dr. Miller, that "Miller's researches clearly demonstrate the fact that acids formed at the seat of decay do actually dissolve the calcium phosphate of the tooth structure," I meant no more nor less than I have here tried to explain.

Dr. Hinkins quotes from Dr. Miller certain statements from the German edition of his "Micro-organisms of the Human Mouth" relating to specific fermentations, upon which in general Miller states that the existence of certain specific fermentations in the human mouth are not definitely made out, and he uses these quotations in rebuttal of my statement that "Miller's research showed twenty-five years ago that acids are produced by fermentative processes in the human mouth." Then he says: "Dr. Miller really showed that certain mouth bacteria generate acids in media *outside the mouth*."

I can hardly think it possible that Dr. Hinkins is here quibbling over the accuracy of the findings of Miller because from experiments made with mouth bacteria outside the mouth he deduced that the same fermentations took place inside the mouth. I say I can hardly believe that he would take that position, when, if I have read correctly the record of his experiments as recorded in his paper read before the Paris Congress, he pursued that identical method himself. When I say identical, I mean with respect to the conducting of his experiments *in vitro* instead of *in oro*. If, however, he does raise that point, let me refer him and any other doubter on that point to Miller's article, "Fermentation in the Human Mouth; Its Relation to Caries of the Teeth" (*Independent Prac-*

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titioner, 1884, vol. v, page 60), where Miller seems to have anticipated just that type of criticism and says:

"Experiment One: Fresh saliva is mixed with sugar or starch, one to forty, and kept at blood temperature. It invariably becomes acid in four to five hours. But some one no doubt will say that this is a result of no consequence because the experiment was not made within the oral cavity; for his personal benefit we give the following:

"Experiment Two: A glass tube, two cm. long, and three mm. wide, is filled with starch, sterilized and fastened to a molar tooth in the mouth on going to bed; next morning the contents of the tube will have a strong acid reaction. A cavity in a tooth or a piece of linen which may be saturated with a solution of starch will answer the purpose as well as the glass tube. That the acid is the same in each case, will be further established below." As is well known the report of his further study of the matter showed the acid referred to to be lactic acid.

I understand Dr. Hinkins to claim that in his Paris paper he showed that which Miller had not already shown, namely, that other acids besides lactic acid were formed by fermentation through the agency of mouth bacteria, and demonstrated not only the existence but the strength of the acid solutions produced by these specific mouth bacteria and showed their solvent action upon tooth structure. I have no issue with Dr. Hinkins on this point whatsoever, nor do I think he has any issue with me thereon. I merely stated, as I have already noted, that the general fact of the causation of oral acidity by the action of ferment germs had been demonstrated by Dr. Miller, and in that I think I am correct, and I am of the opinion that that is the generally accepted belief among members of the dental profession. If I am wrong in that belief I am quite willing to be shown that I am wrong, for I shall at least be wrong in good respectable company. It seems to me that Dr. Miller himself holds to the opinion which I have just stated, for I find at the beginning of his fourth paper in the series on fermentation in the human mouth at page 281, vol. v, June, 1884, of the *Independent Practitioner*, this statement as expressing the general conclusions which he has reached at that time: "Having established upon an experimental and scientific basis the fact that caries of the teeth is to a certain extent the direct result of the action of ferment acid or acids upon the tissue of the tooth followed, particularly in the case of the dentin, by the action of the ferment micro-organisms themselves upon the decalcified tissue, it becomes a matter of first importance to determine, first, by what means we may counteract the action of the acids or prevent their production; second, by what means we may save the decalcified tissue from complete destruction," and in a footnote appended to this paragraph at the bottom of the page Dr. Miller says: "The chief work

in the production of caries is performed by lactic acid ; other acids are only auxilliary factors."

It seems to me then that the issue on this point is really between Dr. Hinkins and Dr. Miller, rather than between Dr. Hinkins and myself, for I feel that what Dr. Miller himself has published on this question is a sufficient justification for my statement that Miller had established the general fact and character of fermentation in the human mouth in so far as it is related to caries, and I see no justification in the position taken by Dr. Hinkins that in expressing my belief that what Miller has said is true, I have robbed him of the credit due to him and endeavored to credit it to Miller.

**Dr. Miller's Test for
Lactic Acid in
Caries.**

Dr. Hinkins takes issue with me for the statement made by me that Dr. Miller showed that acids formed at the seat of decay did actually dissolve the calcium phosphate of the tooth structure. For authority for that statement I refer him to page 118 of the *Independent Practitioner*, March, 1884. "I have been able with some degree of certainty to establish the presence of lactic acid in carious dentin by a method theoretically so simple that it seems strange that it has never been made use of before, but which, however, in practice is only carried out with great difficulty. My first and second attempts were only partially successful; the third succeeded sufficiently well to justify its description here.

"In this experiment I made use of fifteen teeth, all containing considerable quantities of carious dentin, and all extracted on the day of use. The remains of food were first removed from the cavities, but none of the softened dentin; then all the softened dentin was taken out and placed in a porcelain vessel, cut or picked into fine pieces, placed in a test tube with one cc. of water and two drops of a ten per cent. solution of hydrochloric acid added. Any free lactic acid in the carious dentin would remain free, and any existing in combination with lime would be set free by the hydrochloric acid. It was then gently shaken with about 25 cc. sulfuric ether, and the latter holding the lactic acid in solution was, after some minutes, poured off into a second test tube; here it must be allowed to stand from twenty-four to forty-eight hours till it becomes practically clear. It was then filtered into a porcelain dish, evaporated, a few drops of distilled water and a small quantity of *freshly prepared* zinc oxid added, gently boiled (water being added as necessary) for ten minutes, the three or four drops of liquid remaining filtered on to a glass slide, and allowed to crystalize. I obtained the forms seen in figure two. Their close resemblance to the crystals of the lactate of zinc will be seen at once. There can, in fact, scarcely be a doubt that they are lactate

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of zinc crystals. The lactic acid concerned in their formation must, of course, have existed in the carious dentin."

**Comments
by Hinkins on
Miller's Work.**

Dr. Hinkins puts in evidence certain analyses of carious teeth and sound teeth reported by Miller in his book in which it had been shown that the loss of calcium phosphate occurred in the carious portion of the teeth analyzed, and says concerning this work, "but this by no means proves that the acids or the acids alone were the solvents; there are other products of fermentation present, such as ptomaines, organic nitrogenized bases from the proteid contents of the teeth, etc., and the possibility of solution by these was not excluded." He also states that "there are other things besides acids that dissolve calcium phosphate, namely, bases and salts," and reports the findings of Young and Hurst "that neutral salts, like the chlorides and nitrates of potassium and sodium which occur in all salivas, dissolve calcium phosphate with the simultaneous formation of acid." He asks: "Did Dr. Miller's experiments then prove that the bacteria generated the acids in the mouth and that these then dissolve the teeth, or do his experiments prove that bacteria are able to draw potassium chloride around them in unusually large amount, and that this potassium chloride dissolves the tooth at the same time giving rise to the acid?" And he replies to his own question by saying: "I submit that Dr. Miller's experience did not decide between these two possibilities."

**Dr. Kirk's
Views.**

As to these points which I have quoted involving others raised by Dr. Hinkins I have to say that in my reading of Miller's work I am unable to find anywhere the claim made by him that he has completely solved the whole problem of the etiology of dental caries. On the other hand I find a number of specific instances where he clearly states that there are yet many factors in this complex problem unsolved, and I think that as to that we are all in agreement. Nor can I see that all of this contention made by the author to prove, as I understand it, that Miller has not completely solved the problem of dental caries or to show that I have literally or unintentionally credited him with that honor is germane to the question originally raised by him, namely, that I have endeavored to take from him credit that belongs to him and give it to Miller.

As to the action of neutral salts, for example potassium and sodium chloride upon calcium phosphate, let us always remember that calcium phosphate is one thing and tooth structure is another, notwithstanding the fact that calcium phosphate is the principle inorganic constituent of tooth structure. I am in complete sympathy with the efforts of Dr. Hinkins to

work out the action of these solvents occurring in the mouth upon the tooth structure, but I very gravely doubt, even though it may be shown that neutral salts can dissolve calcium phosphate as such, that these same neutral salts can dissolve that compound as it is combined in the structure of the tooth.

I have in my possession a number of teeth of the lower animals that I have kept preserved in a strong solution of sodium chloride for between four and five years. I have recently examined a considerable number of these specimens, and the enamel surfaces appear to me to retain their normal luster and appearance perfectly, and to show absolutely no evidence of chemical action from the unusually large quantity of sodium chlorid with which they have been kept in contact for the time mentioned.

Dr. Hinkins may urge that this is an observation made outside of the mouth, and is of no value. He raised the point in his paper read before the St. Louis Congress, and in reference to that Dr. Miller said in discussion: "Dr. Hinkins offers us a theory to the effect that the physiological secretions of the body are in a condition to destroy the structures of that body. As has already been pointed out by Birgfield, this does not seem to me to be a logical conclusion. It would be surprising to me if nature had done so bad a job as to make herself destructive of her own body substance. It would be as though we held that the pepsin of the gastric juice destroyed the mucous lining of the stomach, etc. It seems to me that in the process of evolution a thing of this kind would have been done away with long ago."

In the present status of our understanding of biological processes and of vital chemistry I can not help feeling that the answer made by Dr. Miller to this question is amply sufficient. Dr. Hinkins has certainly not produced any direct evidence to show that his suggestion is entitled to any more serious consideration than may be given to any suggestive hypothesis.

**Etiology of
Erosion.**

Up to this point, Dr. Hinkins, as I understand him, has been discussing the relation of oral fermentation processes mainly from the standpoint of their connection with the etiology of dental caries, and he next takes up the question from the standpoint of the relation of these same processes, generally speaking, to the question of the etiology of that condition which we have come to call erosion of the teeth.

Dr. Hinkins says in his paper: "Dr. Miller did not mention in his article that he took the pure organic acids, free from bacteria, and treated

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teeth or cements with them to test their solubility. Furthermore, let us see what Dr. Miller said in St. Louis in discussing my paper on erosion."

In the paragraph which I have just quoted it seems to me that we have the evidences of certain misconceptions which are fundamental in their bearings upon one of the main questions at issue between Dr. Hinkins and myself. In the first place I am not aware that he read a paper on erosion at the St. Louis Congress. The paper which he did read, and which he evidently alludes to here, was a paper entitled "The Solvent Action of Saliva on Cements." The bearing which the report of this research by Dr. Hinkins had upon the question of erosion was scarcely more than alluded to. Secondly, I never said anywhere, nor have I ever said anything which was intended to imply that I thought that Dr. Miller "deserves the credit for proving that these organic acids dissolve the calcium phosphate in erosion." The thing that I did say, and from which Dr. Hinkins draws the inference as to erosion, is as follows: "I am quite familiar with the contents of Dr. Hinkins' paper read in Paris, in 1900, and have recently re-read it with care, and I am unable to see what bearing the paper has upon the question of dental erosion other than the fact that he has by his researches shown that cements are soluble in the acids produced in the human mouth as the result of fermentation set up by certain classes of micro-organisms. I take it for granted that the facts which Dr. Hinkins' researches tended to prove are generally accepted by all who have given any attention to the question, especially as this general fact was also clearly demonstrated by the researches of Miller nearly twenty-five years ago in his study of dental caries." (*Dental Cosmos*, vol. xlvii, page 338.)

I hope I have been able to make my meaning clear. The general fact of fermentation in the human mouth producing acid end-products is the thing to which I have referred as having been demonstrated by Miller in his work nearly a quarter of a century ago in relation to the problem of etiology of dental caries. I have not said that Miller claimed credit for showing that this same fermentative process, or these same fermentative processes, produced the acids which caused erosion. I have not credited him with that discovery, nor have I attempted to take from Dr. Hinkins the credit for any part of that discovery, if it is a discovery, which may justly belong to him. I do not consider the mere suggestion which Dr. Hinkins makes in his paper read before the French Congress, in 1900, that the organic acids which he isolated in his experiments dissolved tooth structure, calcium phosphate, zinc phosphate, etc., as of sufficient magnitude in or of itself, nor can I see that it contains sufficient elements of novelty to entitle him to the credit for solving the etiology of erosion. I do not know that he makes such a claim, but it

does seem to me that he regards his suggestion in that direction as recorded in his paper on that subject somewhat in the light of filing a caveat, or a claim for priority in the solution of the erosion question. In saying this, I am merely expressing the impression which the reading of his paper makes upon my own mind. I do above all wish to do him justice in any inference that I may draw, and I confess to my inability to clearly understand from his latest paper, or from some of his other writings on the subject, just what claim it is he does make if it is not the one I have here indicated.

I am charged by the essayist as having prejudice, because I have publicly stated my belief that in its relation to dental caries the work of Miller did establish the general fact of the production of acids in the mouth by fermentation, and I am charged in his summing up of this phase of his essay with crediting Miller alone for these researches relating to bacterial fermentation in the mouth.

It is always, or nearly always, possible to read a sentence in more than one way. I trust that such explanation as I have here given will make it clear that my meaning is not that which Dr. Hinkins has drawn from my statement in so far as it bears upon the part which I believe the researches of Miller have played in this matter.

The Principles and Practice of Filling Teeth with Porcelain.*

By DR. JOHN Q. BYRAM, Indianapolis, Ind.

In endeavoring to present "The Principles of Filling Teeth with Porcelain," the author realizes that many methods of performing operations are transient. The desire to give to our patients the best at our command necessitates changes, so the practice of to-day may be improved to-morrow. Operations are dependent, in a measure, upon the individuality of the operator, and that method which may be most successful with one dentist may be inadequate with others.

Before proceeding further, the author wishes to acknowledge the work of all who have earnestly labored for the development of porcelain art in dentistry. The many suggestions received from his confreres have been invaluable to him, and it is with their assistance that he attempts this work. He claims no originality, but desires to give a compilation of that which seems to be best from the writings of many of the ablest porcelain workers.

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The problem of aborting or abating caries of the teeth, is one that always has, and always will confront the dentist; and until we are able to prevent dental caries, our principal work will be to check it. In order that caries may be abated to the greatest possible extent, it is necessary that the affected portion of the tooth be removed and replaced with a substitute. There has been a desire on the part of many to find a substitute material that would satisfy the esthetic sense by simulating the natural tooth, while also affording permanency of the operation. That desire has found frequent expression and experiments have been made with a number of materials; the two that have received the most attention have been cement and porcelain. As the former has so far failed to fulfill more requirements than the latter, our efforts are best directed in perfecting the methods of filling teeth with porcelain.

While porcelain seems to present hygienic advantages, along with its cosmetic values, it is by no means a prophylactic filling, and unless prophylaxis is practiced by both dentist and patient, many good fillings will fail. It is essential that the patient should keep the mouth as nearly hygienic as possible, and that the dentist should utilize prophylactic measures during the operations.

The art of filling teeth with porcelain is comparatively new, and it may be said that it is still in a developmental stage. Porcelain as applied to the dental art prior to 1885 was practically confined to the manufacture of teeth, crowns, and rods used as "cavity stoppers," and the construction of continuous gum dentures. About this time a method of constructing glass fillings by fusing powdered glass into positive molds of the cavity, constructed of an investment material, was introduced in Europe. Shortly afterward inlays were produced in America, by burnishing matrices into the cavities and fusing porcelain into them. By the untiring efforts of a few dentists in various sections of America and Europe, the subject of porcelain as a filling material has been kept before the profession.

Too much credit can not be awarded the pioneers of porcelain inlay work, and we wish to pay our tribute to all those gentlemen, through whose untiring efforts, and perseverance, it is possible for us to accomplish such artistic results. The stimulus engendered by the efforts of these earnest workers, resulted in the development of this art to a higher standard and caused others to begin studying the advantages of this material; so in 1900 a wave of enthusiasm burst forth from all parts of the globe, and now the methods of filling teeth with porcelain are familiar to many dentists. This advancement was made possible, in a measure, by the increased facilities and improved products furnished by the manufacturers.

It is true that the application of porcelain has been indiscriminately and injudiciously employed. This has resulted from over enthusiasm on the part of a few, and ignorance of the properties of porcelain and the principles of inlay work on the part of many.

Porcelain inlays have passed the experimental stage, and their value as cosmetic fillings is more universally recognized.

The beginner should comprehend that a good porcelain inlay worker must have a keen observation; a thorough knowledge of the principles of inlay work and of the properties of porcelain; a mastery of the technique and a knowledge of the principles of color formation, with the eye trained to detect the delicate hues of a color. While it is desirable to have a thorough theoretic knowledge of porcelain inlays, it is impossible, however, to perform operations in this branch of dental art, without proper technical training.

That we may be better acquainted with certain terms used in dental porcelain art, let us consider the following glossary:

**Glossary of
Technical Terms.**

Dental Porcelain. A material composed of silicon oxid, the silicates of aluminum, potassium and sodium, which becomes a hard dense mass by the process of fusion.

Silex. The oxid of silicon, which is a white, highly fusible, moderately hard, crystalline substance.

Kaolin. The hydrated silicate of aluminum, which is white, opaque, refractory clay, resulting from the decomposition of feldspar.

Feldspar (Orthoclase). The silicate of aluminum and potassium with varieties and in which the aluminum is partially replaced by sodium. It is a translucent, moderately high fusing substance, and varies in color.

Fusion. A chemico-physical change produced by subjecting porcelain to enough heat units for a given time to cause a rearrangement of the molecules, with partial vitrification, and a glaze of the surface of the mass.

Soft Biscuit. A state resulting from heating porcelain sufficiently to harden it only enough to permit it to be carved.

Hard Biscuit. A state resulting from heating porcelain sufficiently to harden it enough to prevent carving, but yet not enough to produce shrinkage.

High Biscuit. A state resulting from heating porcelain sufficiently to obtain shrinkage, but not enough to produce glaze.

High Fusing Porcelain. A porcelain which requires more than five minutes to fuse at a heat not exceeding 2,000 degrees F.

Low Fusing Porcelain. A porcelain which requires less than five minutes to fuse at a heat not exceeding 2,000 degrees F.

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Basal Ingredients. Those ingredients which form the fundamental mass of the porcelain. Viz.: silex, kaolin, and feldspar.

Flux. A material used to increase the fusibility of porcelain.

Pigment. Metals or their oxids which, when added to porcelain and heated to a high degree, will produce a definite hue of color.

Frit. An intense pigment which is fused with feldspar and flux and then ground to a fine powder and used as the coloring material for dental porcelain.

Basal Body. Porcelain composed of the basal ingredients and the pigment. This includes such terms as block body, tooth body, etc.

Foundation Body. A basal body, the fusibility of which has been increased by the addition of a flux, and one which requires more than two minutes to fuse at a temperature of 2,100 degrees F.

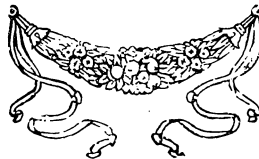
Enamel Body. A basal body with enough flux added to give it greater fusibility than that of the foundation body.

Foundation. That portion of an artificial tooth, crown, or inlay, which takes the place of lost dentin.

Enamel. That portion of an artificial tooth, crown, or inlay, which takes the place of the lost enamel.

Glaze. A highly translucent, colorless, vitrifiable substance which, when applied to the surface of porcelain fuses at a lower temperature than the enamel, produces a highly glazed surface.

Platinous Gold. An alloy of gold and platinum containing less than 50 per cent. of platinum.





Some Considerations in Retention.

HERBERT A. PULLEN, D.M.D., Buffalo, N. Y.

Read before the American Society of Orthodontists, N. Y., Dec., 1906.

The earnest workers for the advancement of orthodontia along scientific lines, have recognized for some time past the undeveloped possibilities in the field of retention of corrected malocclusions. To realize that improvement in technic and method in the construction of simple, efficient and esthetic retaining appliances is a great present necessity, we have only to observe the numbers of failures which are daily called to our attention.

In my opinion, there are three reasons for this state of affairs; first, because the rapid strides of diagnosis, prognosis, and treatment have outstripped the latter consideration of retention; second, the advancement in retention methods have been made by individuals, and no systematic collection and arrangement of the various individual methods has been attempted; third, it has taken some time to reduce the complicated retaining devices of the past into simple mechanisms with an efficiency viewed from the standpoint of retaining of the normal relationship of the inclined planes of the cusps of the teeth in occlusion.

The importance of the retention problem naturally increases with the progress of treatment toward perfection, and it requires the same minute attention to detail and method.

Experience is really the best although the hardest teacher, for the first failure of the novice will force him to realize the value of the

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mechanical principles of force and resistance, of physiological laws of growth and development of alveolar processes, of art and esthetics.

Surely, the attainment of the ideal in occlusion and facial harmony ought to be enough to ask of the skill of the operator without the extra problem of retention, with all its vagaries and complications.

Truly, we can say that orthodontia is not only an exact, but an exacting science, in its demands upon the knowledge and skill of the humble delver into its mysteries.

It is with a great deal of pride that I can say that I believe the greatest advance in the developments of retention methods has been made by the American Society of Orthodontists, through the individual and organized efforts of its members to attain perfection in method and results in their chosen field.

Much has been said and written about the ease with which the ready made appliances may be adapted, and many individuals believe that the science of orthodontia consists in the simple application of the arch and molar bands, and that the restored occlusion is retained in this condition by virtue of its own temporary integrity or perfection without further mechanical retention.

Such a cramped conception of the requirements of orthodontia belongs only to the novice and the inexperienced, who learns only through failure to secure results and maintain them, that orthodontia is a science which requires an unusually high order of skill and ingenuity, and an extended knowledge of its mechanical and physical aspects by those who practice it successfully.

A rather late realization of the truth often comes to the beginner, when after dismissing a case with perhaps no retention at all, or at least an inefficient apparatus, the return of the malocclusion causes him to reflect on the wisdom of foreknowledge of the requirements of retention.

Just at this point I wish to lay especial emphasis upon one fact: *although normal occlusion is attainable in the correction of malocclusion, it can not be depended upon for retention except in simple and special cases, or after varying periods of fixed retention of the teeth and arches with appliances especially constructed for the purpose.*

At least we can congratulate ourselves that retention is a field in which the ready-made appliance has little, if any, use, and that in its varied characteristics of mechanical construction, the individual can give scope to his ability in the attainment of perfection, in the mechanical artistic and esthetic features which the lover of the art alone can enjoy.

Where, except in a previous practice of dentistry, consequent upon a college training in the principles of dental science, can the young man entering the field of orthodontic practice, hope to receive that training in

mechanics which will enable him ever to rise above the mediocre in his ability to construct the often times necessarily complicated retaining appliances?

Is the M. D. degree alone any guarantee of the mechanical fitness of an applicant for admission into your rank? Is it even a guarantee of his fitness as an oral surgeon, possessed of sufficient knowledge of dentistry to enable him to understand the diagnosis and treatment of the simplest untoward symptoms which might develop in the care of a case of malocclusion?

Experience has already answered these questions in the negative, and the time is soon coming when these notions will disappear like the fog under the sun's rays, through a clearer perception of the requirements of the science of orthodontia.

Retention of teeth and arches which have been

Importance of Retention.	restored to normal relations of occlusion is as important in its bearing upon the success of the work of the orthodontist as the treatment itself, since in almost every case it is a necessity for the permanence of the result, both of occlusion and of facial harmony.
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Many an otherwise successfully conducted case has come to failure because the principles of retention were not understood, or else were intentionally ignored.

In the first place, the retention of a corrected malocclusion is a matter of more than a few weeks in point of time, usually, many cases requiring months and some of the more severe, several years of fixation in order to overcome the resistance of the fibers of the peridental membrane and the tendency of arches to contract and assume their original shape after expansion and other operations thereon.

Retention may be defined as the maintenance of sufficient antagonism to the forces tending to cause the return of a corrected malocclusion to its original condition, to ensure the permanence of the normal relationships of occlusion which have been established.

If the forced effort to return is greater than the antagonizing resistance of the retaining apparatus, the retention can not be perfect and more or less return of original malpositions of teeth and arches may be expected. An equilibrium of these forces must be maintained in order to secure proper retention.

There are two principles in the consideration of the retention of the teeth which should be studied in every case; viz., the physiological and the mechanical, the former dealing with the changes during and subsequent to tooth movement, the stage of development of the arches, the resistance of the fibers of the peridental membrane, and the varying

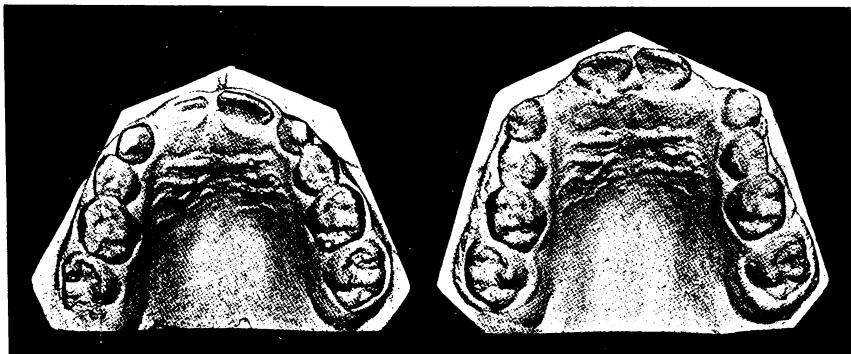


FIG. 1.

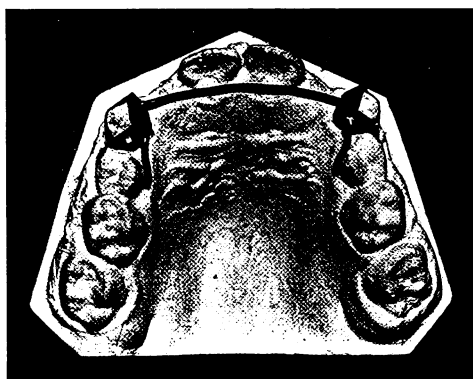


FIG. 2.

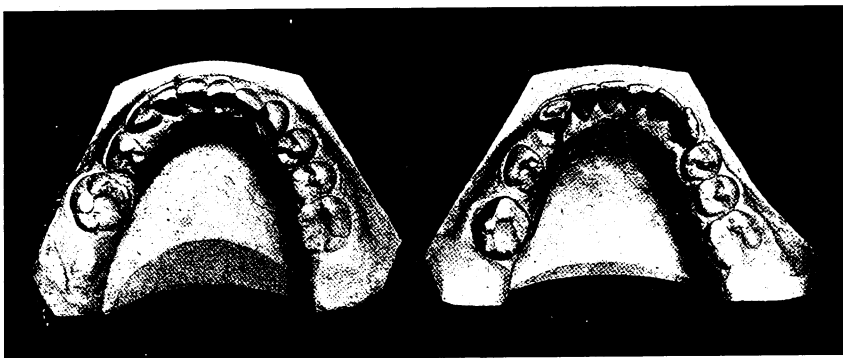


FIG. 3.

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densities of the alveolar processes, etc., and the latter, with the study of resistance to return tooth movements and the construction of the simplest and most efficient appliances which will answer the requirements of retention.

The alveolar processes being superimposed upon the underlying bone of the maxilla and mandible, and continuous in development and resorption with the development and loss of the teeth, concerns us chiefly in the study of the physiological changes in the tissues surrounding the moving teeth.

Retention During Development.

It is reasonable to suppose, from the rapidity of development of the alveolar processes during certain stages of the eruption of the permanent teeth, that the movement of the teeth at the time when these changes are taking place, conforms most nearly to a natural and physiological process, and that the amount of absorption of alveolar processes in advance of moving teeth is comparatively slight, the change in these structures being analogous to the natural developmental changes which would occur in case no malocclusion had existed.

For example, at the age of six years, that being the stage of development of the arches in the treated case in Fig. 1, any expansion of the arch, or gaining of sufficient space for the eruption of the developing permanent teeth, serves only to assist Nature in her own retarded developmental processes, which through some slight cause, either local or remote, have not been uniform nor sufficient for the accommodation of the teeth which may be ready to erupt.

The more experience the orthodontist has in correcting malocclusion of the teeth of children, or in its prevention, by simple and painless operative methods, the more does he become convinced of the manifold advantages to be derived from the treatment of these cases prior to or during the stage of rapid growth that is exhibited during the eruption of the permanent teeth and the development of the alveolar processes at this time.

Whatever may have been the immediate or remote cause for the arrest of development in the anterior part of the arch shown in the left cast in Fig. 1, it is certain that the restoration of the spaces for the eruption of the permanent laterals, and the mechanical widening of the arch, most nearly simulates Nature's efforts to produce that growth and development which should be normal in the case.

In other words, we can not consider the operation of expansion in this case, as shown in the cast on the right, to be an unnatural widening

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or enlargement of the dental arch, but simply an assistance to a natural development otherwise unattainable through arrested developmental conditions.

It is often noticed in cases of this kind that the tissues in the immediate neighborhood of the operation begin to develop quite rapidly, and many times an erupting tooth which has been arrested at a certain stage by reason of the undeveloped condition of the arch, will begin to erupt very rapidly during the period of expansion and making of room for it in the arch.

One principle which should be observed in these early operations is the gaining of more than sufficient space for the accommodation of

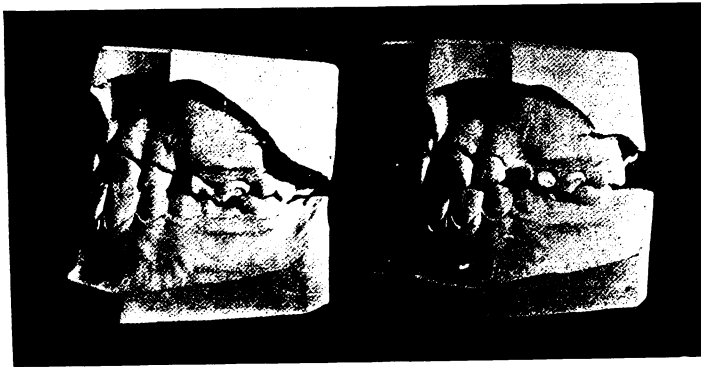


FIG. 4.

the erupting teeth, as more or less space is lost through the settling back of the teeth after expansion, even with the retaining appliance in position, so that what was apparently sufficient room by actual measurement for a developing permanent tooth, would be found to be slightly diminished and inadequate for the placing of this tooth in its proper position in the arch.

This condition of affairs must be taken into account in the retention of these regained spaces, and an appliance used which will most perfectly answer the requirements of fixation of the positions of the adjacent deciduous teeth which have been moved to make room for the eruption of these permanent teeth.

An appliance which will efficiently retain the anterior part of the arch during the developing period, and attached entirely to the deciduous teeth, is shown in Fig. 2, being the retention of the anterior part of the

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arch of the case shown in Fig. 1. A great amount of strength in a retaining appliance attached to the deciduous teeth is never necessary because of the slight resistance they afford to the action of force appliances in their movement, due to their small short roots, and the cartilaginous nature of the alveolar process during their dentition.

As the retention of the deciduous teeth is only a temporary affair, such retention should be under the watchful care of the operator at frequent intervals, so that on the early indications of the absorption of the roots of the deciduous teeth supporting the retainer, the appliance

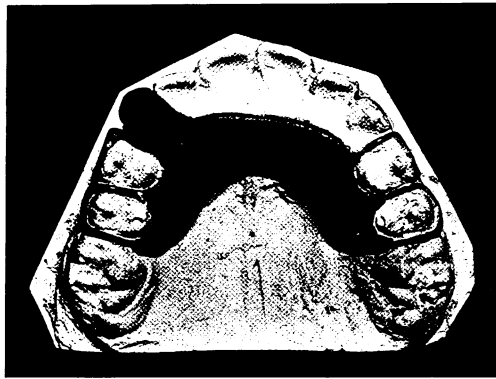


FIG. 5.

may be removed and reconstructed upon other teeth whose rigidity will be of sufficient duration for the permanence of the result established by the operation.

There is also this difference between the retention of the deciduous teeth and the permanent ones; retention of the deciduous teeth is a process of temporary fixation for development of the arch alone, while retention of the permanent teeth is often a necessity for the maintenance of them in their relative positions in the arch, regardless of development, although, of course, the permanent teeth are also retained in certain positions for the purpose of securing development of the arches when necessary.

In the cast on the left of Fig. 3, it will be observed that the second deciduous molar on the left side of the arch has been prematurely lost, and its space closed up in the manner usually followed in such cases, there being insufficient space for the eruption of two bicuspid between the permanent cuspid and first permanent molar on that side.

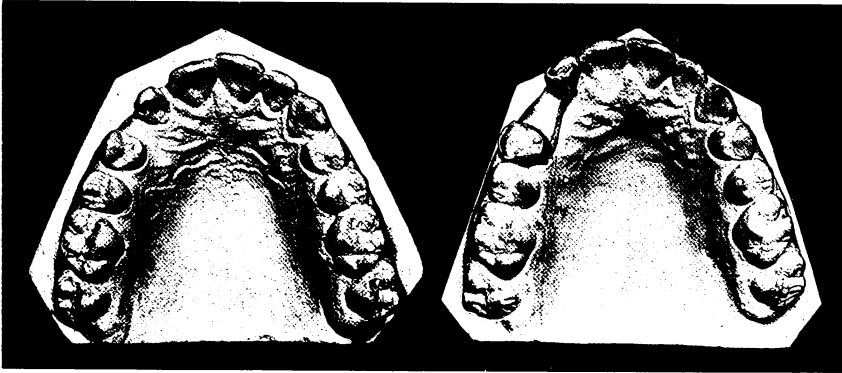


FIG. 6.

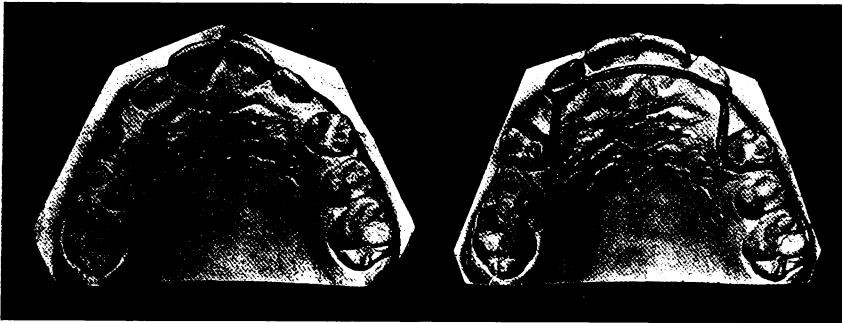


FIG. 7.

The retention of the regained space after operation may be noticed in the cast on the right, both cuspid and molar being banded and a strong bar soldered to the lingual surface of each band, the whole being cemented in position until the eruption of the bicuspid.

It is a well known fact in orthopedic and orthodontic practice that the rapidity of the restorative or building up process in bony tissues, as after setting of fractures, is proportionate to the degree of fixation of the parts during the period immediately following the corrective operations.

To the end, therefore, of shortening the time of retention as well as obtaining a more perfect development and greater strength of the tissues surrounding the moved teeth, and avoiding the possibility of any loss from contraction of arches after expansion or of regained spaces, the fixed retaining appliance, with cemented bands, is now generally to be preferred to any other.



FIG. 8.



FIG. 9.

Roof-plates.

To illustrate, in the past, the removable roof-plate, as seen in Fig. 4, with spur extending out through the space regained for the cuspid, was long considered efficient for the temporary character of the retention, as the occlusion was sufficient to retain the four incisors and very little tension was required to hold the space open for the cuspid.

After continued trials of this plate, the writer was compelled to give up its use, because of more or less loss of the space gained for the eruption of the cuspids, and the inconstant and unreliable pressure exerted by an appliance which was retained in position only by suction, or a couple of tiny spurs imbedded in the plate and extending into the interproximal spaces between teeth on opposite sides of the arch.

A removable plate which is efficient to a greater degree, in similar cases, is shown in Fig. 5, the Jackson spring clasp attachments serving to make the plate remain in position very firmly during the time necessary for the cuspid to erupt. An artificial tooth attached to the rubber spur which extended through the cuspid space, gave an esthetic appearance to the appliance when in position.

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Although the writer finds an occasional place for the use of the roof plate with the spring clasp attachments as shown in the cut, a fixed retention with bands and spurs has proven much more satisfactory.

Fixed Retainers.

An exactly similar case in Fig. 6, exhibits a retaining appliance, which, by having two cemented bands connected by a strong spur, leaves no question as to the constancy of fixation and perfect retention of the space for the unerupted cuspid.

A little more esthetic, perhaps, in its construction, and fully as efficient, is a fixed retention from one first bicuspid to the other, in Fig. 7,

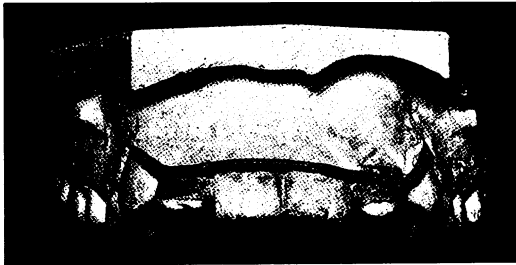


FIG. 10.

retaining the regained spaces for the eruption of both cuspids. Bands are cemented upon both of the first bicuspids, having previously been united with the strong 16 gauge bar of clasp metal extending along the lingual surfaces of the incisors, and having spurs of 21 gauge (B. & S.) clasp metal bent around the distal angles of the lateral incisors to the labial surface to hold the four incisors intact.

This appliance is as simple and esthetic as can possibly be constructed for a case of this kind, and the writer believes that it could well be used as a standard retention for similar cases in which no rotation of any extent is necessary in the incisor region.

The left side of the case in occlusion, before and after treatment, is shown in Fig. 8, and one is struck by the inconspicuousness of the retaining appliance from this view.

In confirmation of a theory which has long been held by many writers on orthodontia, I have collected, in one case, at least, sufficient evidence to warrant a firmer belief in certain physiological processes occurring after tooth movement, which are of intense interest to the orthodontist, especially in the consideration of certain features of retention which have puzzled the ablest and most acute observers of the functional disturbances coincident with tooth movement.

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In an operation on a thirteen-year-old boy for the extraction of a supernumerary right lateral incisor, and its replacement by its natural substitute, whose position in the arch the supernumerary had usurped, there were taken three X-ray pictures of the seat of the operation between the right central incisor and right lateral incisor, representing three stages which might be of scientific value in the study of bone changes coincident with orthodontic operations, one being taken at the beginning of treatment, the second, after extraction of the supernumerary

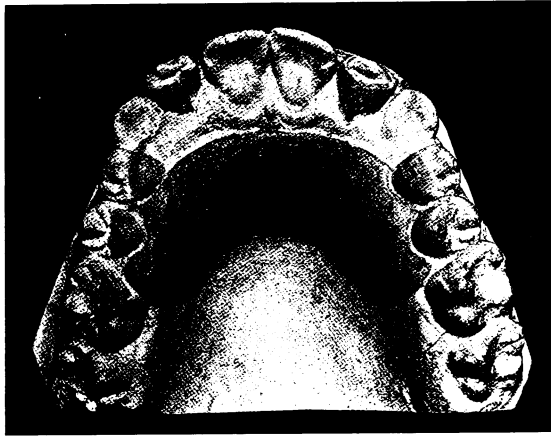


FIG. 11.

and correction of the malocclusion, and the third, being six or eight months after a period of fixed retention of the normal lateral in its proper position.

The first radiograph exhibited the normal relationship and density of the bony tissues between these teeth; the second, considerable absorption of tissue after the extraction and the breaking down of tissue ahead of the moving lateral; the third, a very complete and perfect reconstruction of the bony septum intervening between the central and lateral after the fixed retention, for a period of at least six months, of the normal lateral.

Although this evidence of bone reconstruction after resorption has been carried out in but the one case, it is a source of some satisfaction to observe the working out of Nature's processes through the medium of the X-ray, especially if they are confirmatory of theories which we know must be true in order that a permanence of the results obtained by orthodontic operations may be assured.

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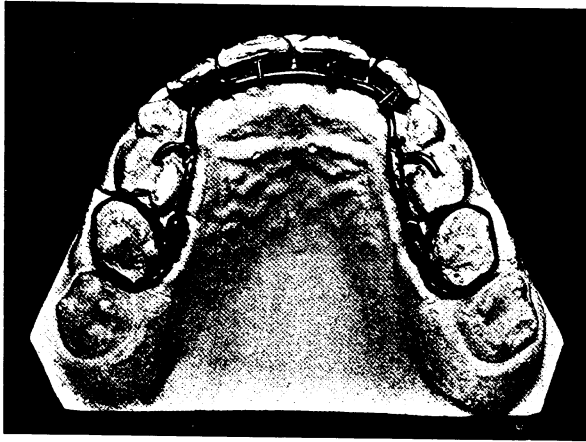


FIG. 12.



FIG. 13.



FIG. 14.

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We have become accustomed to divide the retention of the individual arches into the portions anterior and posterior to the cuspids, retaining the alignment of the incisors with a fixed retaining apparatus, and the enlargement of the arches after expansion with a removable apparatus, usually in the form of a plate.

The average case requiring this method of retention is represented by a contraction of the anterior part of the arch, with the cuspids out-

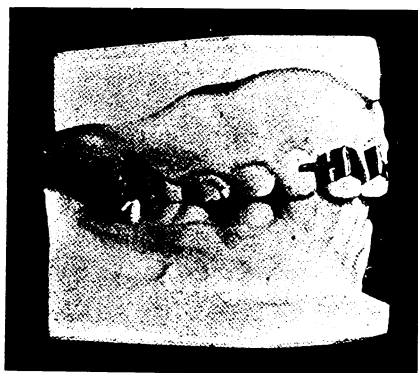


FIG. 15.

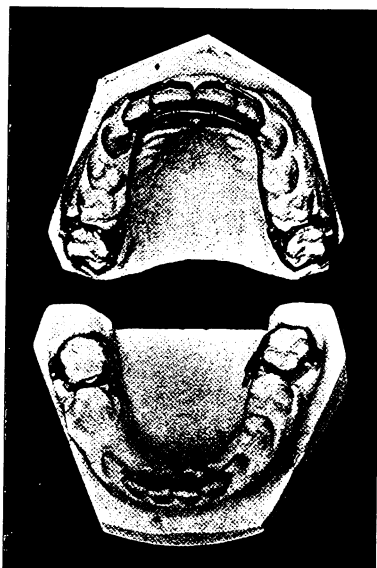


FIG. 16.

standing, the usual retention of the incisors and cuspids being an appliance consisting of two bands upon cuspids, united by a strong lingual bar touching the lingual surfaces of all of the incisors.

Whereas this appliance is effective in many cases, in others it does not seem to answer the purpose as well.

For example, in Fig. 9, the retention of the anterior part of the arch is obtained by banding the laterals, extending labial spurs over the cuspids to keep them in place, and a lingual looped wire from one lateral band to the other, the loop answering the purpose of allowing the spaces between the incisors to be closed up during the first few days of retention and bringing a pressure to bear upon the labial surface of the cuspids sufficient to keep them in alignment.

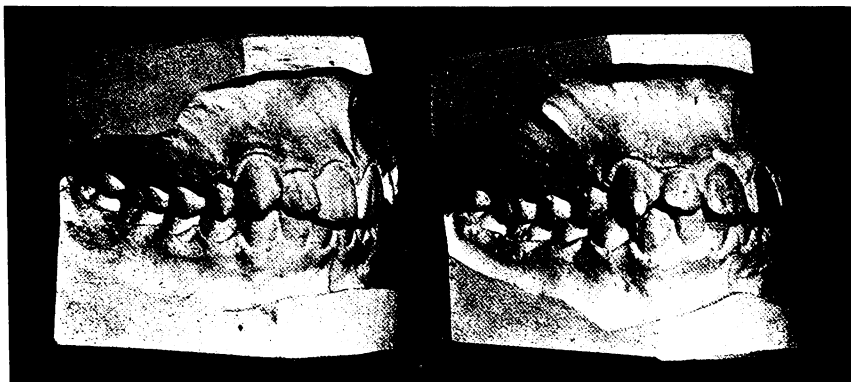


FIG. 17.



FIG. 18.

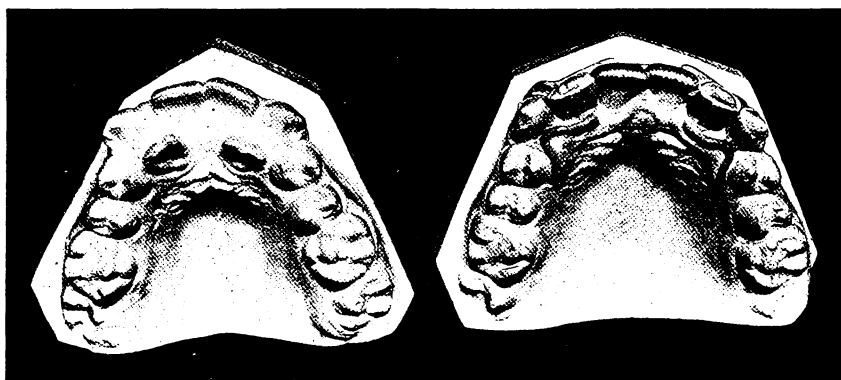


FIG. 19.

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The loop is contracted by means of a pair of round nosed pliers which can be made to bring pressure on either side of it.

A variation from this appliance for the purpose of retaining the anterior part of the arch is seen in Fig. 10, the laterals being banded, and the bands connected upon the labial surface by the retaining wire which also passes over the labial ridges of the cuspids. Advantage can be taken of the settling backward of the incisors with this appliance in position, to bring sufficient pressure to bear upon the labial surfaces of the cuspids to keep them harmoniously aligned, a feature which is not possible in the usual retention from cuspid to cuspid, the bands upon each of these teeth being connected with the lingual base wire.



FIG. 20.

Its worst feature is conspicuousness, which will offset its otherwise good qualities.

The retention of the posterior part of the arch after expansion is usually accomplished with the removable roof-plate, which, although not conforming to the laws of fixation of a retaining appliance, seems to have been more or less popular on account of its easy construction and adaptation.

In the form shown in Fig. 11, the roof-plate depends upon adhesion and small wire extensions into the interproximal spaces between the bicuspid for its support, relying upon the laterally inward pressure of the arch to return to its original position to assist in retaining the retaining appliance, a rather unreliable support in view of the inconstancy of position of the appliance.

The roof-plate in this form often fails because of the great pressure of the return forces causing it to slip out at one side, when its usefulness is over.

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It can be made effective to a greater degree by the addition of the Jackson spring clasp attachments around bicuspid or molars on both sides as the case may need.

Lingual Arch Retainers.

The use of the lingual arch for retention, as suggested by Dr. Lourie, invites many possibilities of artistic and esthetic retention of the teeth.

In Fig. 12, its use in retaining the incisors from going back into their sockets after being elongated is effective, especially with the spur over the occlusal surfaces of the deciduous molars to assist in the support of the lingual arch in position.

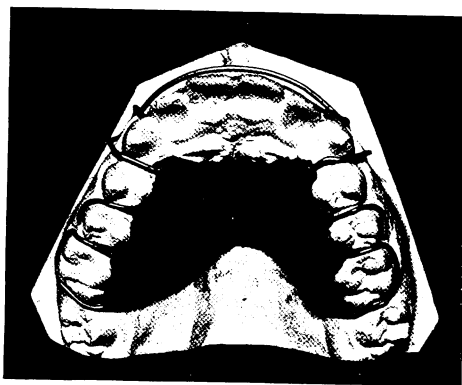


FIG. 21.

The arch is soldered at either end to the ends of the lingual screws of the molar clamp bands which in this case were placed upon the second deciduous molars.

Following closely the curve of the arch, the lingual wire passes under lugs soldered to the lingual surface of the incisors, and the molar clamp bands with the lingual wire are first cemented into position, and then the incisor bands are filled with cement and slipped between the teeth and the wire and forced into place.

The retention of incisors which have been rotated may be accomplished by the lingual arch method by attaching spurs to the lingual angles of bands upon the incisors which have been rotated, mesially or distally according to the direction necessary to overcome the return tendency, these spurs to be bent around the lingual arch in such a way that they are very firmly attached.

Fig. 13 illustrates the right occlusion and Fig. 14 the left occlusion, before and after treatment, of a case of Class II, Div. I (Angle), the

patient being nine years of age, and having the deciduous cuspids and molars still in position.

It is a good plan to retain these cases until the permanent cuspids and bicuspids have erupted into occlusion, so as to get the benefit of the retentive force of their inclined planes in occlusion.

A buccal view of the retaining appliances used in this case is shown in Fig. 15, the upright spurs upon upper and lower molar bands serving to retain the normal mesio-distal relationship established between the arches, and the bands upon the incisors acting in conjunction with a lingual arch, effectually retains the upper incisors in their normal positions.

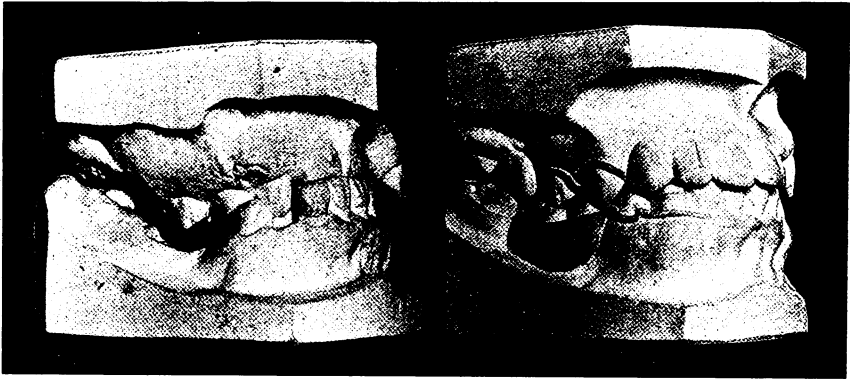


FIG. 22.

The buccal spurs upon the molar bands are constructed of square German silver wire, which is admirably adapted to this use, as it gives flat surfaces for the sliding of the inclined planes of the two spurs when antagonizing during occlusion.

A view of the lingual arch wire in position on this case is seen in Fig. 16, attached to the ends of the screws on the molar clamp bands, and following the curve of the arch accurately close to the necks of the teeth, and in the incisor region, having attached to it by small wire spurs bent around its circumference, the two incisor bands, which, with the addition of spurs upon their labial surfaces extending over the laterals, retain the four incisors from moving forward.

These retentions are rather difficult to make, but that they must come into general use for reasons of esthetics and efficiency, seems probable at this writing.



FIG. 23.



FIG. 24.

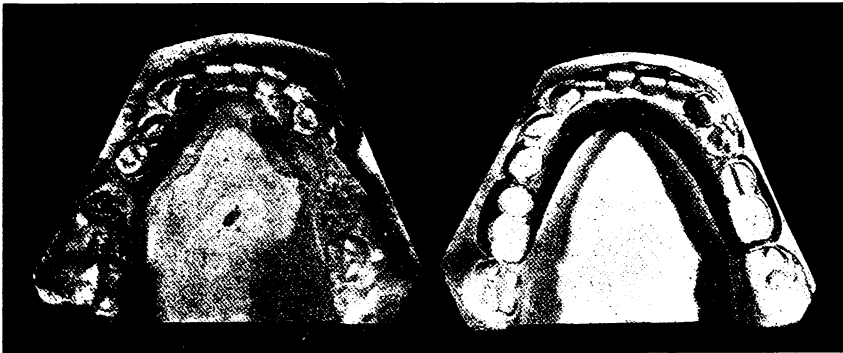


FIG. 25.

Fig. 17 illustrates the before and after treatment models of a case of Class II, Div. 2, subdivision, in which there has been a shifting of the occlusion on the right side only from distal to normal.

A unique feature of the retention is the spur extending from the band upon the right lateral incisor over the labial surface of the cuspid (Fig. 18), which assists in retaining the upper cuspid and bicusps on the right side from moving forward. The band and spur also serve to keep the lateral from rotating, for which purpose it was originally intended.

The interlocking spurs upon the first molars retain the corrected occlusion in the molar region.



FIG. 26.

The retention of laterals which have been inlocked is sometimes difficult owing to the lingual inclination of their roots immediately after their movement into alignment, and their tendency to slip back into their former positions inside of the arch.

In a case like that shown in Fig. 19, the usual cuspid to cuspid retention has proven ineffectual in the writer's practice, it being found necessary to band both laterals and cuspids, with labial spurs upon the lateral bands extending over the adjoining teeth, and lingual spurs upon the cuspid bands, extending over the lingual surfaces of both laterals and bicusps. This retention is not permanent, as the full development of the anterior part of the arch has not taken place, but it answers the purpose of effectually holding the lateral incisors in place until such development has occurred as will place the roots of these teeth in their



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proper relationship with those of the adjoining teeth, when a slight readjustment of the anterior teeth may be necessary.

The retention of the protrusions of Class I has always proven a difficult matter, but the favorable results from the lingual arch attached to incisor bands in Class II, as in Fig. 16, seem to indicate that the same retention can be used to advantage in a protrusion of Class I, Fig. 20, where the added strain of buccal spurs for retaining the molar occlusion need not be reckoned with.

Up to the present time, the retention of this class of cases in the writer's practice has consisted of a removable plate, Fig. 21, with spring clasp attachments on molars and bicuspid, and a spring wire extending around the cuspid and incisors, and capable of being so adjusted that a slight tension is kept upon the incisors during the time it is worn.

There are some cases occurring in practice which seem to be exceptionally difficult to diagnose and treat on account of the loss of many of the permanent teeth, and the consequent complications caused by the elongation of teeth, and contraction of arches, etc.

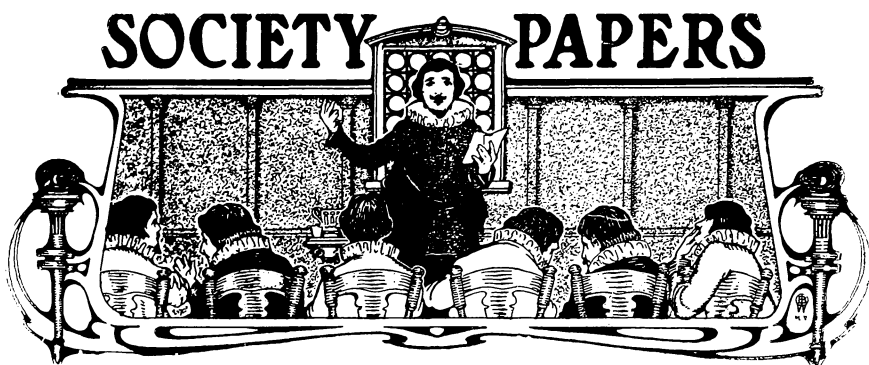
Such a case is exhibited in Figs. 22 and 23, before and after treatment, with retaining appliances in position in the after treatment models. Here, as in the previous case, the plate, with spring clasp attachments, plays a very important part, not only in retaining spaces regained for permanent teeth, but also supplying artificial substitutes attached to the plate itself.

A view of the upper casts of this case in Fig. 24, shows the retention of five of the anterior teeth with the lingual spur from lateral to cuspid, and a roof plate, with spring clasp attachments and three artificial teeth, effecting the retention of the rest of the arch.

Another plate with spring clasp attachments and artificial substitutes for natural teeth which were missing, accomplishes the greater part of the retention of the lower arch as seen in Fig. 25, in position in the cast on the right.

The profile of this case, before and after treatment, is exhibited in Fig. 26, as illustrative of the effectual retention of the normal position of the teeth and arches by the appliances just shown in position on the casts.

In extreme cases of Class II and III, the continued use of the intermaxillary elastic from one arch to the other for an indefinite period is proving an efficient aid in those cases in which the usual methods of retention does not seem adequate. These elastic bands are so adjusted that they will just counterbalance the tendency of the arches to return to their positions of mesial or distal occlusion.



Clinical Reports of Some Cases of Oral Surgery.

By DR. J. E. POWER, Providence, R. I.

Read before the New Jersey State Dental Society, Asbury Park, July, 1906.

Mr. President, ladies, and gentlemen; on account of the number of cases which I am going to present this evening, by the aid of the stereopticon; I have decided to take the liberty of simply describing the cases which have come under my observation and treatment, rather than of presenting an essay upon the subject of oral surgery. I shall be glad to suggest, as far as my limited experience will permit, the treatment of any case which your honorable body may see fit to present. It is possible that some of the slides will not be new to all, but to many they may prove novel and entertaining. From a large number of cases which I have had the good fortune to observe during a private and hospital experience, I have selected for your discussion only those which appear to me somewhat unusual.

Osteoma of Hard Palate.

Fig. 1 is an osteoma of the hard palate. For years this patient wore a partial upper vulcanite plate. Instead of covering the whole roof of the mouth, it was cut away in such a manner that it came to the edge of the bony enlargement. About six months previous to her visit to me, the growth began to enlarge. She did not give much attention to this condition. It gradually increased until it assumed great proportions. About nine months afterward, the tumor had grown so large, that the natural functions of deglutition and articulation were interfered with to such an extent, that she sought medical advice. In due time, the

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patient was referred to me, by her regular physician. After satisfying myself of the existence of the conditions already described, I advised the removal of the tumor by surgical procedure. The consent of the patient was obtained, and the operation was performed.

The operation consisted of making an incision through the soft tissues covering the hard palate (Fig. 2), from behind the two central incisor teeth, back to the soft palate. With a periosteal dissector, I freed

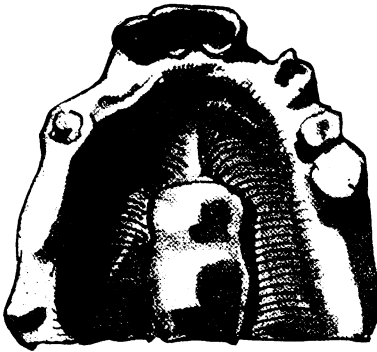


FIG. 1.



FIG. 2.

the tissues covering the hard palate, and reflected them back as far as the ridge on both sides. I then passed a silk ligature through the reflected membranes on each side, and my assistant, by virtue of these ligatures, kept the field of operation clear while I removed the tumor. In an operation of this kind, it is well to reflect the tissues covering the roof of the mouth back as far as possible. By proceeding thus, you minimize the possibility of the serious injury which is often brought about by undue pressure exerted upon the sides of the reflected tissue (indicated by crosses in Fig. 2), in removing a tumor of this kind. The procedure was as follows: A bur rapidly revolved in the engine was directed through the tumor in an oblique direction, backward and upward toward the hard palate. Then the instrument was withdrawn, and directed through the growth from the summit, toward the base, in such a manner that it would meet the end of the oblique canal made by the first step with a bur. Then the instrument was withdrawn and reintroduced through the side until it met the other two canals. Finally a number of holes through the tumor weakened it to such a degree that I introduced a steel instrument, and pried this section away. This process was repeated until the whole growth was removed. Next, I used a large bone bur to smooth the projecting particles of bone, washed the surface

and brought the flaps together as is shown in Fig. 3. Five or six sutures held them in position. Healing was accomplished by first intention. The ligatures were removed in due time, and patient was discharged cured. This method of sectional removal was resorted to in this case, in view of the fact that a chisel could not be used on account of a danger to the patient, that of inspiring the small particles of the bone, which would necessarily be broken away, during the chiseling process.

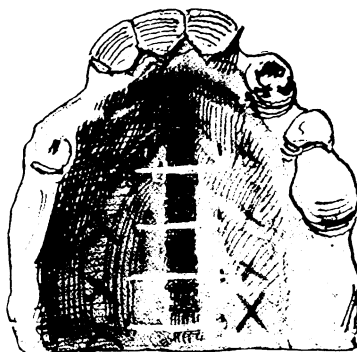


FIG. 3.

Fig. 3 shows the flaps drawn together. Twenty-four hours after, the patient's temperature was normal. In adjusting the ligatures, I placed them some distance apart as shown by crosses in Fig. 3. After such an operation, there is generally some vomiting, and the convulsive action of the muscles is certain to tear the tissues through which the ligatures are passed. This patient was thirty-two years of age.

**Arsenical
Necrosis.**

It is reasonable to suppose that this case (Fig. 4) is one of arsenical necrosis. The swelling does not appear in the picture as marked as it did in life.

It shows the much distorted face of a child, who was referred to me by her dentist. She had been under observation by this dentist for some time. About three months before she visited me, a tooth in which the pulp was partially exposed, had been "capped" by a dentist (not the family dentist). A few days previous to her visit to me, the tooth commenced to ache, with its subsequent swollen face, etc. Examination showed that the whole surface of the superior maxilla, from the central incisor tooth to the first bicuspid tooth, was involved, and the incisor teeth elongated as shown in Fig. 5. An operation was performed which consisted in removing the upper front teeth, which were very loose. I then curretted the bone as far as the bicuspid tooth, and upward

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toward the floor of the nose indicated by line in Fig. 4. The patient made a quick recovery. The rapidity with which the degenerative process involved the bone, together with the history, leads me to believe that the tooth capping material contained arsenic. The characteristic destructive processes, which are associated with this form of necrosis, were present here. We never find a pathological condition, whether it be necrosis, or any other form, unless there is some cause for it. We can in this case, consistently exclude other possible causes. Therefore, I do not feel it unfair to presume that this condition was due to arsenic.



FIG. 4.



FIG. 5.

which formed a part of the capping preparation. The destruction of the bone in this case was extremely rapid; in three days the whole area was affected, and it was still spreading. In consideration of this testimony, it may not be unwise for those of you who use "capping" preparations, to examine more carefully the substance which you seal in teeth.

Incision to Avoid Scarring.

I hope to be able to show you by this case of necrosis (Fig. 6), that a medical incision may be made on the external surface of the face, and still remain concealed, to some extent. In the medical schools, we are taught to make a surgical, and never a medical, incision. From experience, I am willing to believe that a surgical incision means an incision about three or four times as long as is necessary. In dealing

with unfortunate patients I endeavor to put myself in their place. I would much prefer to inconvenience myself, taking a longer time to operate, than render the result of the operation unsightly. A patient's face, whether it is man or woman, is a thing that the surgeon should handle with the greatest care, and the surgeon who disfigures the features of a patient, as the result of carelessness, is guilty of malpractice. In this case on (Fig. 6), the abscess was in such a condition that an external incision was compulsory. The text books teach us that the incision of an abscess should be made through the whole of said abscess. If this advice had been followed in this case, we would have had a scar



FIG. 6.

FIG. 7.

which would disfigure the boy for life. Instead of making an incision through the abscess, I made a small one under the jaw, and below the abscess as shown in Fig. 7. Then with a blunt instrument I communicated with the abscess from the incision, and curretted the dead bone. You can easily understand how readily drainage was obtained under these conditions. Daily irrigation was resorted to, and finally the patient was discharged cured.

**Empyema of
Antrum.**

The next is a case of empyema of the antrum of ten or twelve years standing. The model which is being passed among you is made from an impression taken from the upper maxilla. Some ten years ago, the patient received an injury in the antral region, by being struck by a cow's horn. About a year previous to her visit to me, the swelling commenced within the area marked by dotted line in Fig. 8, but no pain was associated with it. She became alarmed, and thought that the en-

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largement was malignant. My first step was to excise a small piece of the tissue, and have it subjected to a pathological examination. This step should be resorted to in all cases of oral surgery. In all cases, we are bound, in the interest of justice, to give the patient the benefit of such an examination. After receiving a negative report from the pathologist, I advised an operation which consisted of making an incision through the swelling, curretting and removing the dead bone. Then I



FIG. 8.

drained the antrum, washed the antral cavity thoroughly each day, and finally the patient made a complete recovery. This case is of interest, on account of the unusual location of the swelling.

**Serious Result of
Abscess in Temporary
Tooth.**

The next is a most interesting case. A child about five years of age was suffering from an abscessed temporary tooth. He was taken to a dentist evidently of that class who believe it an unwise thing to extract a tooth while the face is swollen.



FIG. 9.

Basing his judgment upon a theory which is inconsistent with the first principles of pathology, this dentist told the child's parents that the

tooth should not be extracted until the swelling of the face had subsided. The pain increased very much from day to day, and the mother took the child to a physician for advice. He confirmed the advice already given by the dentist, but supplemented it by telling her to apply hot flaxseed poultices to the child's face. In forty-eight hours, the poultices did, as is always the case, an irreparable injury. The tissues under the eye became more highly inflamed, and the pus forced itself through as is shown in Fig. 9. The patient was now treated by the physician during the next five weeks, and at the end of that time, the whole of the left superior maxilla, and the malar bone, were involved. The case



FIG. 10.



FIG. 11.

was finally referred to me, in the condition just described, including a high temperature. Pressure upon the face anywhere below the line of the eyes would cause a large quantity of thick pus to flow from the opening under the eye, from the nose, and from the mouth. I advised an operation, first explaining to the mother, the possibilities of such a step upon so serious a case; that even if operated upon, it was within the realm of possibilities that he might not recover. She finally consented. Two operations were performed upon the child. The first consisted of removing a large part of superior maxilla from the lateral tooth back to the tuberosity. This section did not extend to the center of the hard palate.

Fig. 10 shows a part of the bone removed at the first operation. Much of the specimen was lost, therefore this represents only a portion of what was actually removed. The operation consisted of placing my finger in his mouth between the teeth and cheek, holding the cheek out of the way while I dissected the cheek from the skull in such a manner that I could pass my finger up by the side of the jaw through the opening under the eye. By so doing, I was able to get a continuous passage. Irrigation was therefore made more thorough, and the small particles of necrotic bone, which have the power of re-infecting the parts operated upon, were washed away. I gave the little fellow considerable attention,

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which amounted to about seventy visits. Generally we leave the dressings of such cases to the nurse. But this case had for me a sort of irrepressible fascination. I longed for the succeeding visiting time, feeling confident that I would be able to controvert any pathological changes more easily, if I took entire charge and was not dependent upon the reports of the nurse.

At the end of four weeks, another operation was performed which comprised the removal of a portion of the malar bone, which is shown in Fig. 11.



FIG. 12.

In operations for necrosis, I scrape the bone until I think I have scraped enough, and then scrape some more, and in dealing with this case, "I scraped some more" twice.

The restoration of the contour of the face, which you will see in Fig. 12, is due to the tissues becoming cartilaginous and filling the space formerly occupied by the bone. The break in the tissues under the eye was a little troublesome. It persisted in closing from the outer surface. To overcome this, I placed powder in the opening. The secretion under the eye, mixed with powder, formed a hard mass. The motion of the tissues against the hard mass produced irritation. This was causing another abscess to form. I knew that if I could find a powder which would be impervious to water, I could accomplish the desired results. Finally, after experimenting with several antiseptic powders, I was rewarded by finding one upon which water had little, if any, effect. The name of the powder is "Pulvola." Each morning I would break the adhesions on the outer surfaces which had formed during the night. I then filled the cavity with the above named powder. After a few days granulation began to take place in the bottom of the cavity, and the wound closed from the bottom. Restoration of the contour was the

result, instead of the unsightly depression and enlargement of the eyelid, which would have been the outcome if the wound had been allowed to close from without inward.

Every step in this operation has been done from the inside of the mouth. I always avoid making incisions on the external surface of the face whenever I can do so. If, however, we are obliged to make an external incision in the face, it is better to make it through one of the natural wrinkles of the face, for there it will at least be partially concealed. Following the second operation, the case progressed favorably for five or six days. Then pus began to form again. The inflammatory



FIG. 13.

path was working back toward the ear, and you can readily understand the dangers and complications which might arise, if the pus reached the temporo-maxillary articulation. So I made a small incision a little further back, of which no trace was left after the recovery.

**Arsenical
Necrosis Resulting
from Dyed Yarn.**

The next case is one of arsenical necrosis (Fig. 13). The patient had a high fever, and as a result, had been delirious. The seven or eight teeth which remained in position were all loose. The mouth was in a highly inflamed condition. There was intense pain, together with a marked lessening of his bodily resistance. It did not require great skill to diagnosticate this condition.

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I advised an immediate operation, which consisted of curretting the infected area of the bone, from one angle of the superior maxilla to the other as shown in Fig. 14 I. The model which is being passed among you is a duplicate of the mouth after the operation was performed. I removed all the necrotic bone with a curette. This degenerative process had gone so far, that the inferior border of the bone was as thin as a piece of cardboard. I could feel the bone bend as I passed my curette over it. Within forty-eight hours the patient's temperature was normal. I dressed the wound each day, painting aromatic sulphuric acid (full strength) on the surfaces of the bone. I have found that this acid has a specific action in aiding the vital bone to throw

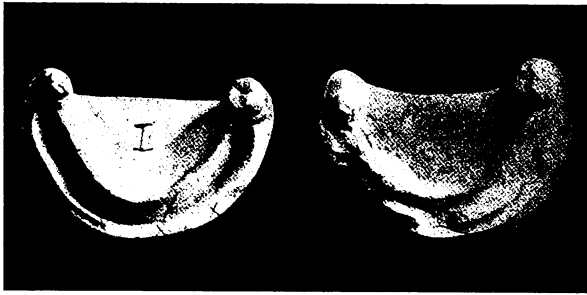


FIG. 14.

off that which is devitalized. The plaster cast corresponding to Fig. 14 II shows that the bone and tissues have filled in the space (contrary to the text-books).

A most interesting feature connected with this case, is the method by which he was infected. After I discharged him, I questioned him to ascertain the kind of necrosis with which I had been dealing. According to his replies to my questions, his disease was not necrosis. But from experience, I was equally sure that his disease was necrosis. When I first visited him I asked him some questions regarding syphilis. He denied ever having had any infection of that kind. I familiarized him with its symptoms in detail. In some instances it is well to take this precaution and describe the primary symptoms, especially in necrotic conditions, or any other condition where syphilis may be a probable factor. In many cases a person will say that he has never been infected by syphilis. He may know it by some other name, and if you ask him in a technical way about these things, he will say "no," because he does not comprehend what you mean. Therefore, it is wiser to go into details. I questioned him about gonorrhea to make sure that he did not confuse that with

syphilis, or syphilis with gonorrhea. He replied that he never had had an infection of any kind. Then I went into the other various kinds of infections, and his replies were negative. I was positive that he had had necrosis, and my last question was, "What do you use to clean your teeth?" I thought perhaps he used some of the preparations which are sold on the streets, that are said to make black teeth turn white in one night. He replied that he did not use anything to clean his teeth, with the exception of a piece of yarn, which he passed between his teeth to remove any particles of food which became lodged there. I asked him



FIG. 15.



FIG. 16.

if the yarn was colored, and he said that it was. I requested him to bring some to my office. I made eleven chemical tests for arsenic, and found its presence in nine of the eleven tests. Basing my conclusions upon this testimony, I think it reasonable to say that this case was one of arsenical necrosis, induced by the absorption of the drug into the tissues, from the yarn, during the time the patient used it for the purpose above described.

**Frontal
Sinusitis.**

In Fig. 15 you see a sinus in the frontal bone, communicating with the frontal sinus. This patient had had several operations for the treatment of frontal sinusitis. She was among those who appeared for treatment at the hospital clinic. Examination disclosed the conditions you see, with the pus flowing from the sinus. The pain in the region of the malar bone, the frontal bone, and eye, was constant and intense. The history revealed the following facts: (a) that a dentist tried to extract the cuspid tooth but broke it in the attempt; (b) that she had been treated for septicemia three times; (c) she was treated surgically for frontal sinusitis twice. The following treatment was resorted to

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by me. I made an incision from the attachment of the cheek downward to the edge of the gum line, through the canine eminence, and, with a chisel, broke through the bone. I next introduced a probe into the canine cavity, and found a piece of tooth not larger than a small pea, which I removed. I irrigated the cavity and treated the patient during the next three or four days. Within ten hours the pus stopped flowing from the sinus in the frontal bone for the first time in four years. My connection with this case I am especially anxious that you shall understand. Indeed, I did not even suspect that the tooth had anything to do with the frontal sinus trouble; I did not operate for the purpose of treating the frontal sinus. I did, however, operate with the assurance of curing the pain in the region of the malar bone, as well as the inflam-



FIG. 17.

FIG. 18.

FIG. 19.

matory condition under the eye. I am very much pleased, however, to be able to report a cure in this case, as well as to illustrate that pathological conditions will many times manifest themselves in places remote from the seat of lesion.

Fig. 16 shows the manner in which the patient's hair was arranged for the purpose of concealing the scar. Five years have passed, and the patient's condition remains normal.

Fig. 17 shows another case of necrosis. This is an anterior view. It is difficult to show the true condition. The swelling which was on the right side of the face was much marked in life, and was very hard. Compare the relation of each ear to the cheek, or with Fig. 18, and you will get a better idea of the enlargement. The patient could not move his jaws

Necrosis.

far enough apart to allow the insertion of my smallest finger between his teeth.

Fig. 19 shows patient attempting to open his jaws. He was suffering intense pain. I was one of the consultants, and after obtaining a history of the case (which showed that the man received an injury to his jaws while boxing fifteen years before), and making an examination, I pronounced the case necrosis. Generally in necrotic cases we have pus, and when we have pus we have fluctuation. In this case, I was unable to get fluctuation. My theory to explain this was that the pus was probably between the ramus of the bone and the fibrous covering of the muscles. This was only a theory, and I advised operation, contrary to the opinions of some of the other gentlemen, who were



FIG. 20.

FIG. 21.

physicians and surgeons. One thought it was malignant. A pathological examination proved that it was not malignant.

An operation was performed by one of the surgeons three days later. It consisted in making an incision through the cheek as indicated in Fig. 20. The bone was curretted, treated daily for three or four weeks, and finally the patient was discharged cured, but badly disfigured. This operation was performed over a year ago, and since that time the patient has not been able to eat a meal without first bandaging his head with a towel as is shown in Fig. 21. During an ordinary meal he saturates this towel with saliva, which comes from the parotid gland through the incision, flows down the side of the cheek to the point of the chin, and finally drops on his clothing. We read a great deal about the danger of

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cutting arteries and nerves; that is a danger, but there is a greater danger and that is the danger of cutting this gland. The incision as it is shown in the picture was not the best place which could have been selected for the exploration, which was necessary in this case. Would not one represented by the dotted lines in Fig. 20 be more consistent with our ideas of modern surgery, and serve the same purpose after the cheek had been reflected? Understand me, gentlemen, this point is not brought up for the sake of criticising this surgeon's technique, but rather to suggest what seems to me a better way from the surgical point of view.



FIG. 22.

FIG. 23.

FIG. 24.

Chronic Fistula.

A child eleven years of age. Sinus of the face. Fig. 22. Pus was flowing out of this sinus during a period covering four years previous to her visit to me. Formerly, this little girl lived in Italy. While there, one of her teeth, which was abscessed, was extracted by a native dentist, who broke it during the operation. The child, however, insisted that the said dentist was a good one, because he wore a medal. The face commenced to swell directly after the tooth was extracted, and remained swollen. A few days later, the family came to this country. The medical inspector in New York sent her to a hospital on Long Island, refusing to allow her to proceed to Providence. She was treated during the voyage by the steamer's surgeon. While on Long Island, she was twice operated upon for necrosis, each time an external incision being made upon the face. She remained in this hospital from January until April, and at the end of April, her father brought her to Provi-

dence, where she was treated for several months by the local physicians. She was then taken to one of the principal hospitals, where she remained longer than a year. During this time, two or three operations were performed. At the end of this period, she came under my treatment with the conditions above stated. I introduced a probe into the sinus, and came in contact with the jaw bone, which did not appear to be very rough. On the contrary, it seemed to be healthy. Therefore I felt confident that the affected area had not been reached by the operations which had already been performed. All the teeth were present, and the inside of the mouth appeared healthy. The history of the tooth being broken by the Italian dentist, together with the age of the child, caused me to believe that the tooth extracted was a temporary tooth. Mistaking it for a permanent one, and not knowing that the root had been absorbed the operator tried to remove the supposed root, and in doing this, had injured the jaw bone. Therefore, I was willing to believe that the seat of the trouble was in the locality of the extracted tooth. The treatment which I followed afterward proved that my theory was correct. I advised the removal of the sixth year molar tooth.

In the sixth year molar tooth you see a small spiculum of bone in the bifurcation of the roots; there is an abscess surrounding this spiculum, and strange as it may appear, there was no manifestation that these conditions did exist. The tooth was vital, had never ached, and did not evidence any pain on being tapped by a steel instrument.

Fig. 24 shows the patient after being discharged cured, five weeks after the operation. After removing the tooth, I curetted the bone, and passed a probe through the socket backward, and out through the external sinus. After I made this communication, I knew that my patient would recover. I irrigated it each day, and finally discharged her cured.

Impacted Third Molars.

The next is a case of eleven years standing. This woman had been operated upon several times in the hospitals, through external incisions, for necrosis. The history of the case was as follows: About eleven years previous to her visit to me, a small swelling appeared on the external surface of the face near the angle. She visited a physician, who referred her to a dentist. Finally, acting under the advice of three dentists, she had all her teeth removed as a progressive step in the treatment of the swelling. Her condition, however, remained about the same. During the next nine years, she was treated by several different physicians. At the end of this time, the trouble began to increase and she sought medical advice again. This time she was referred to a hospital, where she submitted to an operation, and in due time was discharged

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improved. Her condition, however, was about the same as when she entered, presenting the condition shown in Fig. 25. Examination of the inside of the mouth disclosed a small swelling in the region of the third molar, which had been diagnosticated as a tumor. I made an incision through it, reaching the bone. I then passed a probe through the opening which I made to the bone. The probe came in contact with something smooth. I told her that I thought a malformed third molar was the



FIG. 25.

exciting cause of this condition. She replied that she clearly remembered having had the wisdom teeth extracted. Regardless of her seemingly positive statement, I decided to operate along the line suggested by this diagnosis. The patient was anesthetized. I made an incision about an inch long through the tissues covering the ridge; dissected them back, and exposed the bone. Chiselling away the bone, I exposed the crown of a tooth. With a pair of extracting forceps I tried to extract this tooth, but broke the crown off in the attempt, Fig. 26. This complicated matters, so I passed a probe down by the side of the tooth, and found that its position was parallel with the bone. With a chisel I broke away the bone covering the remaining portion of the tooth (about $1\frac{1}{2}$ inches), and exposed it. By means of an elevator, I removed the remaining section of the tooth.

Fig. 27 shows the entire tooth. I examined the other side of the jaw, and found the other third molar present but unerupted. Its position was

normal, but the tooth was very large. I extracted, and curretted socket. Within five or six weeks, I discharged this patient cured, with the sinus entirely healed. Five years have now elapsed, with no recurrence of this trouble. This tooth is shown in Fig. 28.

Fig. 29 shows a splint made for the purpose of holding a compress to control hemorrhage. The patient came under my treatment for the purpose of having a hemorrhage checked, from the socket of a superior first molar tooth. Blood had been oozing from this socket during a period covering seven days. Her family physician, as well as her dentist,



FIG. 26.

FIG. 27.

FIG. 28.

tried to control it by packing the socket with gauze and cotton saturated with several different fluids manufactured for the purpose of controlling hemorrhage. The packing, however, after a short time, would be forced out of the socket by the blood. The most important step in controlling a hemorrhage, is, of course, constant pressure. In this case, on account of the condition of the socket, the pressure was intermittent. My treatment consisted in making a groove around the inner surface of the socket producing a kind of a circular depression all around the walls, making the inside of the socket larger than the orifice. I forced the packing into the socket, and within twenty minutes, the hemorrhage had ceased. The remaining teeth were in such condition that extraction had been advised. Her physician referred her to me some three months later to see if I would extract them. Benefiting by my previous experience, I was reasonably sure that the hemorrhage could be controlled if an appliance could be made and adjusted in such a manner as to hold the compress. I proceeded as follows: First, I procured an impression of the upper and lower teeth, adjusting models on an articulator. I then cut from the plaster model the teeth corresponding to the ones which I

intended to extract. I next made an appliance following the principles employed in the making of splint for a fractured jaw splint. The opening which is shown was made so that the patient could secure diet. Instead of extracting the teeth as I generally do, not paying much attention to the alveolar process, I exercised the greatest care in saving as



FIG. 29.

much of the alveolar process as I could. I extracted very slowly, removing one tooth at a time, and before extracting the next one, carefully packed the socket with gauze. I do not think it a good thing to use cotton in these cases; at least in my practice I do not use it. I prefer sterilized gauze, saturated with one of the chloride of aluminum preparations. I repeated this process until all the teeth were extracted. Then I took a piece of gauze and placed it across the ridge over the sockets, holding it in position by means of a head bandage, and adjusted the splint, or compress holder that is shown in Fig. 29. In thirty-six hours, I removed it, and later took out the compresses, removing one each day. Finally the patient made a complete recovery. Hemorrhage was controlled within sixty minutes.

The Advancement of Prosthetic Dentistry within the Past Quarter-Century.

By HART J. GOSLEE, D.D.S., Chicago, Ill.

Read before the Second District Dental Society, January, 1907.

To seriously contemplate the changes, developments and improvements along general lines which have occurred within the last twenty-five years, one must necessarily look with amazement upon the marvelous advancement the world has made during this epoch.

As members of a profession which has, within this short space of time, become universally accredited as being a distinctly separate scientific vocation, of a profession which has proven to the world that it was but the outgrowth of necessity, and that it has justly earned the recognition and position which it now occupies, may it not be permissible for some of us to pause at this time and consider the advancement which we, as members, know we have made—and which is generally conceded—from the broadest and most liberal view-point, lest we should become too enthusiastic to observe possible deficiencies, or opportunities for still greater achievements?

If such conservative reflection is warrantable, and I believe that it is, it seems to me that in order to arrive at some definite point of reasoning along these lines, we should, first, draw a comparison between the advancement made by this young and vigorous offspring of the parent profession of medicine, during the time specified, and the general advancement embracing the full scope of human efforts made within the same period, in order to arrive at a conclusion as to whether we have cause to be proud or elated, just satisfied, or dissatisfied.

Generally speaking, we certainly have every possible reason to point to our progress with pride, to be elated at our achievements, and to be satisfied with our acquirements; and yet, without any desire to discourage or to be pessimistic, even for the moment, I fear that we also have some reasons for being dissatisfied.

In the light of the recognition which the enlightened world now accords to dentistry, of the importance which it attaches to its mission, of the marvelous strides toward the ideal in the fields of science, hygiene, and surgery which it has made, I would not have you think that I fail to realize and appreciate the breadth and the seriousness of the statement I am impelled to make, and yet it is made, regretfully it is true, but unhesitatingly nevertheless.

**The Retrogression
of Prosthetic
Dentistry.**

Except for the specialties of crown and bridge-work and orthodontia, which are the progenies of prosthetic dentistry, which were born and developed during this period, and which now constitute separate and distinct specialties within themselves; except for an awakening to the correctness of the principles and the practicability of the theories of that great American genius—Bonwill—who labored so earnestly and so patiently during his life-time to make us believe him; except for the introduction of some few new forms of attachments to supporting natural teeth as a means of obtaining greater stability for partial dentures, the application of which makes it possible to cover less of the soft tissues of the mouth, and thereby do

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less injury to remaining natural teeth; except for some slight improvements in cleft-palate work, and the mechanical treatment of maxillary fractures; except for the introduction of more perfectly prepared compounds of porcelain, and for the improvements in artificial teeth, general equipment, and other products of the manufacturer, *prosthetic dentistry* in so far as it relates to the construction of artificial dentures and other forms of dental, oral, and facial restorations, which was the primitive field, and which still embraces what was formerly known as "mechanical" dentistry, has undoubtedly retrogressed rather than advanced.

By way of reaching some logical proof as to the validity of this statement, let us for a moment indulge in retrospection, and cause the curtain to be raised on the stage of dentistry a quarter of a century ago. As we view the characters of the play at that time, we find that the "mechanical" dentist is the stellar attraction; that of him is demanded, and to him is delegated the work which requires the very highest order of skill, and that, crude as his implements and perquisites are, he is nevertheless competent. The operator, the oral surgeon, the orthodontist, and the specialists in therapeutics and hygiene while playing important roles, are nevertheless subordinated to his majesty, the "mechanical" dentist.

Raise the mantle on the stage of modern dentistry and what changes do we note? We find that the acquirement of a higher order of scientific knowledge and attainment, together with the development of greater manipulative ability, and the advent of the gold and porcelain inlay, etc., etc., has in this brief space of time placed the "operative" dentist in the most conspicuous part. We find that the orthodontists and crown and bridge-work men have grown and developed so rapidly as to cause them to assume the dignity of separate and distinct specialists with a field for further and even greater development. We find all of the other specialties growing, developing and occupying positions of increased usefulness and dignity, and after some little effort we finally discover that the "mechanical" dentist—now called the *prosthetist*—has largely relegated himself to the minor and more or less unimportant part of understudy to all of the others.

Twenty-five years ago the services of this same "prosthetist" were in such demand as to entitle him to occupy the role of star in the dental firmament. To-day it is evident that he is not occupying that position. It would, therefore, seem that the skill regarded as being so essentially important then, exceeded the requirements of the present era. This is not necessarily because more work of this nature was needed then than now, but because the character of the work incident to the building of artificial dentures, and to the making of various forms of dental restora-

tions then was on a higher scientific and mechanical plane than now, and hence greater skill was demanded.

The efforts of the prosthetists then were directed largely to the manipulation of the metals, and as a result the acquirement of skill was constantly developed, instead of being retarded, as it has been, by the indiscriminate use of vegetable bases and commercial laboratories, the advent of which has in a large measure sounded the death-knell of progress and advancement along these lines.

The average dentist, then, was a better mechanical dentist than is the average dentist now, and yet look how all other departments of our profession have advanced. It sounds like a paradox, does it not?

**Vulcanite
Rubber.**

Acknowledging that the advent and subsequent common use of the vegetable bases for artificial dentures has played an important part in this deterioration of skill, yet it is by no means alone responsible. While gutta percha and zylonite, or celluloid, of which so much was expected, and for which so much was claimed, have practically proven failures, and been abandoned, "vulcanite" still occupies a place of usefulness which makes it a valuable and practically indispensable adjunct. Its use as a means of affording attachment of teeth to metal bases embraces its greatest field of usefulness, however, because of its pathological incompatibility with the soft tissues of the mouth, due mainly to its physical property of non-conductivity. Its introduction has also resulted in the abandonment of the use of single gum teeth attached to the base by soldering—a type of construction which was formerly in common use—and therefore in the achievement of far more hygienic results in the application of gold and other metals to the construction of artificial dentures.

During this era it has also caused the utilization of *aluminum* as a base to be made practicable, and to become regarded as occupying a great range of usefulness for such purposes, thereby affording a possible stepping-stone in the upbuilding of this class of work from the slough of degeneracy.

It will therefore be observed that the judicious and scientific use of vulcanite has not necessarily been the one important factor it is commonly and generally considered to have been in bringing about this condition—this dearth of skill—in such directions, for indeed in this connection let me say that it requires just as much skill and art to build a vulcanite denture *properly*, as it does to construct one of metal.

**Continuous
Gum.**

If this dearth of skill is questioned, let me say that continuous gum work, for instance, was made even better, and certainly more frequently than now; and yet, during all these years, it has been, and

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is still to be regarded, as the typically ideal denture ; and, furthermore, that better and in proportion more metal dentures, on the whole, and as an average, were made then than are being made now.

If vulcanite is not alone responsible for such retrogression, then to what can it be attributed? What part has the manufacturer of dental supplies, and the commercial dental laboratory, a product of the past twenty-five years played, and are not dental educational institutions in some way responsible?

While it is true that the manufacturers have made such improvements in their products as to materially lessen the labor, and, perhaps, diminish to some extent the actual skill formerly required, still since the manufacturer can not also be the artist it would seem that these improvements in methods, in porcelain teeth and bodies, in the preparation of metals and alloys, and in instruments and facilities, should tend rather to increase than to diminish the products of skill resultant from their introduction.

College and Laboratory Blamed.

It is therefore my opinion that both of the latter institutions—the colleges and the commercial laboratories—are entirely to blame, and that the colleges are primarily so because of being so largely responsible for the advent of the laboratories.

Of the numerous and varied subjects which are now included in the curriculum of the modern dental college, that of prosthetic dentistry *per se* enjoys a unique distinction, for the reason that it necessarily embraces a study of the metals, their physical properties, and their scientific manipulation, and therefore it is recognized as being the foundation of early dentistry, and the very basis of modern dentistry, and yet it is undoubtedly the most neglected phase of advanced dental education.

With no pessimistic views, or over-zealous enthusiasm along circumscribed lines, but, on the contrary, with every desire to acknowledge and show just and full appreciation of the wonderful progress made in dental education throughout the world in the last quarter century, still let us again pause and seriously study the problem as to whether the practical departments have really advanced in the same ratio as have the scientific departments.

While we do not fail to recognize and appreciate the necessity for higher scientific attainments, and for a broad and liberal education in all of the more or less closely allied subjects now embraced in the dental curriculum, let me ask, has the advancement made resulted in the production of better dentists?

Psychologically and theoretically, this question may be answered in the affirmative. The graduates of to-day are more highly educated;

their training has been along broader and on more liberal lines; they are constantly being better prepared to enter into the activities of social and civic affairs, and thereby aid in raising the standard of the profession; in fact, they are in every way better *men*, as a whole, but are they better dentists and are they better fitted to engage in and successfully fulfill their mission?

How many of them are fundamentally equipped to display that remarkable evidence of skill which resulted in the accomplishment of Evans, in prolonging the life of the prince who afterward became the emperor of France; how many Bonwills, Wildmans, Closes, Moffetts, Morrisons, and Essigs have we now, and how many Kingsleys, Haskells, Warrington Evanses, and Taggarts are growing up in our midst?

The practice of dentistry demands peculiar and somewhat versatile accomplishments. It demands a broad and liberal education, and that degree of culture which results therefrom, under favorable environments, but it also demands an artistic temperament and the proper mechanical training. These latter may, or may not, be present as a natural heritage, but are nevertheless capable of development to a greater or less extent in almost every one.

And here is where the colleges are weak, and why they should be censured, for, while prosthetics is undoubtedly the most difficult to teach, because of the fact that no general system obtains, no unification of principles prevails, and no really practical text-books exist; it is nevertheless fundamentally the most important, and, therefore, as is too frequently the case, can not be regarded in the light of indifference, delegated to inexperienced teachers, nor taught in a perfunctory manner.

If more attention had been given to the teaching of this subject in the past quarter century, and if a greater degree of appreciation of the importance of a broad knowledge of the physical characteristics of the metals, and of the value of a proper training in their scientific application and manipulation had obtained, it is difficult to calculate the increased amount of skill which would now be possessed by the average dentist, and it is safe to say that the mouths of the populace of the world would contain more metal and fewer vulcanite dentures, and that greater health and longevity would have thereby resulted.

To this dearth of exercise of scientific skill in these lines can be attributed the advent and growing popularity of the commercial laboratories. Such institutions at best can only be regarded in the light of being a menace to the progress of the profession in its entirety, and yet *they* are not altogether responsible for this because they, also, are the outgrowth of necessity—a necessity, however, occasioned only by lack of

**Commercial Dental
Laboratories.**

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confidence and gross incompetency on the part of the profession, together with an absence of high scientific ideals—and when we realize this, and properly educate ourselves first, and then our students if we be teachers, they will die a natural death, and dentistry, as an art and a science, will be placed on a higher plane.

In this connection I can not refrain from expressing the view that in my opinion no practitioner is justly entitled to aspire to the sublime confidence of his clientele, nor to exact a large or even moderately good remuneration in the way of fees, who employs ready-made and easily adapted products which require but little, if any, skill, and which afford results that must of necessity be of doubtful character.

Indeed, one of the most certain stepping-stones to that degree of success—both moral and financial—to which every honest man aspires, is to so qualify one's self as to be capable of doing that which he undertakes, and doing it well; and in proportion as he so directs his efforts and energies, in just the same proportion will his success be insured.

Even though the tendency to specialize is growing, and granting that such growth is practicable, that the age in which we live seems to demand it, and that it should therefore be encouraged, yet he who lays the broadest foundation is the better prepared to erect the most substantial superstructure in whatever special direction he may choose.

In stating that “mechanical” or *prosthetic* dentistry has retrograded, you will note that I have made an exception as applied particularly to crown and bridge-work, and emphasized the fact that the growth and advancement of this separate specialty has been nothing short of phenomenal. And yet, gentlemen, may I not be permitted to call your attention to the fact that, even in this field, where so many bright minds have contributed toward progress, there has been a lack of co-operation between the workers, and therefore an absence of that classification of requirements, methods and results, without which the whole application of this class of work is still in a more or less empirical stage? This, however, is to be attributed largely to the fact that little or no attention has been given to what may be termed the dynamics of the art, or to the proper classification of conditions and requirements.

Dynamics of Crown and Bridge-work.

For example, there are many ways of making crowns, and many ways of making bridges, and a number of them are good ways. Nevertheless it follows that if conditions in mouths were always similar, we could soon decide upon the one best way of making either a crown or a bridge. But conditions, and therefore the requirements, vary, and so we must have various methods. Thus the scientific selection becomes some-

what complex, since what may be the very best method in one instance, may prove an utter failure when applied to another, or without judgment.

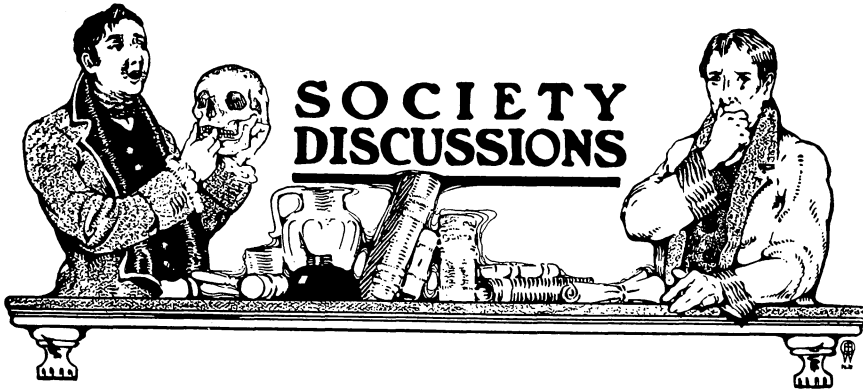
The two primary factors in crown and bridge construction are *beauty* and *usefulness*. Beauty depends upon the art displayed in defying detection, and usefulness upon the ability of the finished piece to serve all purposes of mastication without being destroyed or fractured by the force of stress.

It therefore is always a problem in choosing a method, to select that one which will answer these two demands in the highest degree, and it is my view that when there may be a conflict, choice must be given to that mode which promises the most usefulness; yet exactly the reverse is the common rule. Indeed, notwithstanding a deep sense of appreciation of the esthetic, too many operators make cosmetics their chief aim, and only learn their error when that which was at first a splendid looking structure returns broken or mutilated.

As an example, again, it is not an uncommon occurrence to find pieces of bridge-work *made entirely of gold* torn away from one or the other, or both, of their abutments as a result of stress. In such instances the operator doubtless made the piece entirely of metal thinking that he would thereby sacrifice cosmetics for usefulness, which in principle was correct, yet because of a failure to insure sufficient strength by properly uniting the dummies to the abutments, the entire structure proves a failure, and, only because the dynamic requirements had been overlooked.

It will therefore be observed that there is still room for even further progress along the already well advanced lines of this particular specialty, and also that there is much yet to be learned before empiricism can be removed and the importance of dynamics better appreciated.

After thus indulging my vagaries by calling your attention to further opportunities for promoting even greater growth and development of this class of work in particular, let me now return to my original premise, and, in conclusion, again remind you of the strange and singular phenomena that in the past quarter century all departments of dentistry have advanced with wondrous rapidity *save one*; and that this one embraces the manipulation of metals and the construction of artificial dentures, and is therefore the one which is the very basis of all dentistry; and yet, notwithstanding its great importance, it has assuredly retrogressed.



Second District Dental Society, January Meeting.

The annual meeting of the Second District Dental Society was held in the Kings County Medical Society rooms, Brooklyn, January 14, 1907. The essayist of the evening was Dr. Hart J. Goslee of Chicago, who read a paper entitled "The Advancement of Prosthetic Dentistry Within the Past Quarter Century," discussion being opened by Dr. W. H. Taggart of Chicago. The paper was received with considerable applause and the following discussion ensued.

Discussion of Dr. Goslee's Paper.

Dr. W. H. Taggart,
Chicago.

I am very much pleased to-night to be with you and talk on Dr. Goslee's paper. I think this is Dr. Goslee's masterpiece.

As his paper is not of a technical nature, I have been a very poor one to choose to open the discussion. My line of work is more on the technical side of dentistry. I have to do more with the practical methods.

Some points I wish to talk on. They are principally on the lines of prosthetic dentistry, as our average dentist thinks that it is degrading to be called a mechanical dentist. If I were a teacher in a dental college teaching prosthetic dentistry, I would take the raw material that came to me in the shape of students, and make a mechanical dentist of every one of them. And I would also make artistic mechanical dentists of them. The idea of throwing the students' work together, without any attention to the artistic side of it, is a mistake. I would make the boys take a piece of steel and work on it and bring it down to a finish so fine that they

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could see their faces in it. The line of demarcation between high-grade mechanics and art is closely drawn. During the World's Fair, in 1893, the Coe Company had a large cylinder of steel displayed. It was most beautifully polished and without a blemish. So highly polished and so beautiful that it was to me the most artistic piece at the Fair. It had a placard on it saying "Hands off," but so great a fascination did it possess for me that I constantly returned to admire it, and when I could do so unobserved, I would reach out and touch it with my finger. Such a piece of work proves its maker an artist. Teaching students to do this fine kind of mechanical work is to make artists of them. Men starting out from college to do mechanical work must not allow themselves to fall into the mistake of thinking it is degrading work.

When you make a plate for the mother of a family, it only takes her twenty-four hours to find out whether you are a good dentist, though it may take her children about ten years to find out that you are a fool of a dentist. (Applause and laughter.)

In every small town there always is a woman who will try every dentist and have each of them make a plate until she can get one with "a good suckage." (Applause and laughter.) If you are the fortunate individual your reward will come within twenty-four hours. She will tell her neighbors and friends what a good dentist you are, and these will believe it, too, on account of the better talking of the old lady with her new teeth. This is the kind of advertising you want. The filling of teeth is, with me, a secondary consideration. I have followed all branches of dentistry. It requires ten times the skill to do proper prosthetic work that it does to fill teeth.

**Dr. R. M. Sanger,
East Orange.**

The paper struck a note full of meaning to me. As a teacher I have felt that we have been occupying a false position. The student comes to us only partly prepared for the work before him. He has a strong bias against mechanical dentistry from the first. Yet I believe the fault lies with the dentists and not with the colleges. It is a lack of proper text-books that we in the colleges have to combat. I hope that good books will be prepared which will lead to more direct and better teaching. In teaching I lay stress on students becoming perfect or imperfect dentists according to the way they take hold of all branches of the work. Impress the student that thorough preparation is necessary to become a thorough dentist. I hope this paper will be a starting point for the uplifting of the profession along this line of mechanical work and more thorough preparation.

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Dr. C. E. Weeks,
Minneapolis.

I agree with the first speaker that this paper is Dr. Goslee's masterpiece. It is not too pessimistic. I was formerly associated with a man who thought that the prosthetic part of dentistry must be given its proper place in the curriculum. I agree with others that there is a lack of harmony on the part of teachers throughout the country, but efforts are being made to establish better conditions; yet those efforts are sporadic. I am reminded of a paper I heard years ago belittling the work of the operative dentist. The writer called it "plugging holes." Some man got up and said that while we might admit that this is true, a necessity for plugging holes would exist for years to come, and every dentist should know how to plug holes perfectly. I believe in the advisability of establishing a school where all men who might desire to become laboratory assistants could be taught prosthetic dentistry properly.

Dr. John T. Hart,
New York.

I think the trouble to-day is that we are trying to bring a body of geniuses into the profession; trying to do too much. The fact that we have a body of men in college without sufficient education is the fault of conditions in years gone by. Formerly the majority of men that entered the profession had years of training in dental offices before going into college, which we can hardly expect of present students without previous manual training requirements. The task will be easier when more training is required. At present we have more raw material to work with. Three years is too short a time in which to train a man properly. We will sooner or later all break up into specialties. Students will show a particular bent for some branch and they will need to be trained for that particular branch; we need not try to make men perfect in all lines. If three years of training prove to be enough, then find out the bent of the individual and train along that line, and do not hope to make the perfect individual Dr. Goslee wants. It is now impossible to properly train a man in all fields as in the past.

Dr. B. H. Kelley,
Maine.

We have heard from the West and now I come from the East. I am very little interested at the present time in the subject of mechanical dentistry. Formerly I was very much interested in it, and I feel it has made me a good workman along operative lines. I am now having my first experience with an assistant. My young man is a product of the modern college. He is more interested in the mechanical part than in operative dentistry. We who were trained in offices can not conceive that we ever knew as little as these young men from college know. This school must be teaching very little to turn out such a man as I have.

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**Dr. M. E. Rhein,
New York.**

I want to add my tribute to the paper. I want to emphasize everything said in its favor. Nothing in the paper is exaggerated. I feel absolutely in favor of the young men of the day on this subject.

The fault of this condition is not due to the institutions in the slightest degree. No college of itself ever turned out a great dentist. The day a man enters into the practice of dentistry after college is the day when his real education begins, no matter in what line. The colleges have absolutely no bearing on this subject. I am in hearty accord with what the essayist has said. No man after twenty-five years in practice can gainsay facts that stare us in the face every day. Thirty-five to forty years ago prosthetic dentistry was in its prime in this country. During the past twenty-five years the pendulum has slowly but surely been going backward and backward. Dr. Goslee has stated the reason. It lies among the members of the profession. It exists in every dental office where they cater to patients. The true cause is simply the desire for the almighty dollar which pervades this country. There are very few men in existence who are Taggarts, who have the ability to master all branches of dentistry to the height of perfection, and carry into practical work the same exactness and care for their patient's welfare. The man who thinks he can nowadays reach high developments in every branch is in error. The public will be better served by men devoting their time principally to the part of the work they love best. You must love your work. No unpleasant or uncongenial line of work should be followed. Young men should learn this.

The real cause back of this condition is the dental laboratory. We have brought about the development of men for this purpose. I think this an error in that it has kept down the cause of prosthetic dentistry for the last twenty-five years. It is the reason for the poor class of work. The dental laboratory came to supply a demand on the part of the dentist who wanted to get all the profits himself. This type of dentist either sends the work out or employs a man at a few dollars per week in his laboratory.

If I can read between the lines I believe my views coincide with the essayist's. It is maligning the young dentists to say that this degradation is due to them. If a young man has a love for his work and associates himself with an older practitioner in an office where he is placed on equal terms, he will turn out the right kind of work. In this position I leave my plea for the young man as not being to blame for the condition, but will say it is due entirely to the methods on which dentistry is conducted; unethical and unprofessional in this particular sphere.



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Dr. Chas. H. Meeker,
Newark.

I do not know whether to agree with Dr. Goslee or not. I think every man bases his convictions on his first experience in dentistry. I have come to the conclusion that it is your first steps that guide your practice in after life. I went with a man, Dr. Lounsbury of New York, who first conveyed to his students the principle that they must never take out a tooth if they could save it. I have always gone on that principle.

Now as to the paper. Take a man who does good work in many lines. He is a good gold plate worker, but he has not the time to give to it.

Personally I have to see a number of patients each day, more than was formerly the case, as expenses are heavier and I have to work harder. I love mechanical work and would like to do that altogether, but I am fully occupied with operative work. If I give the work to the mechanical man, I always see that it is properly done, and that it fits and is finished perfectly, etc.

Dr. Rhein said the pendulum had almost come to a standstill. On the other hand to-morrow night we expect to hear from one of the greatest men in this country about a method of restoring teeth to their normal form, making them as useful as originally, and all from the purely mechanical standpoint.

We are all coming back to prosthetic dentistry. It does not matter so much who does the work, you yourself, or the laboratory men, provided that it is properly done. Operative dentistry has in my opinion made the least progress, unless progress means the stuffing of a hole full of something. There has been no real effort to restore from an artistic standpoint the lost portion of a tooth.

The introduction of mechanical laboratories is a big mistake, but there will come a period when this branch will be put on a proper basis. Dentistry will be divided up. No one man can begin to digest and make use of all the good things that are offered to us.

I take my place with the young man. He is not the poor workman in mechanical dentistry that some would have us believe. He has more time than the older practitioner when he starts out and should appreciate that it is extremely important to know mechanical dentistry. He should never turn out a piece of work from his office that has not had the benefit of his own supervision at all stages. How many men in this room can made a good metal plate? Not ten of them.

Dr. W. E. Halsey.



SOCIETY DISCUSSIONS

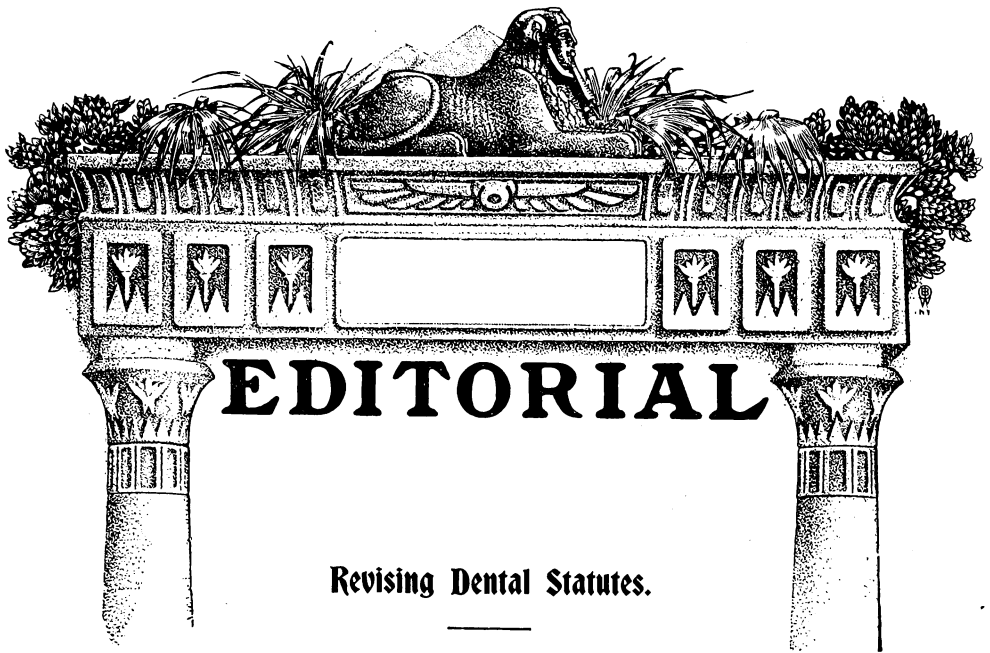
Dr. R. Ottolengui. Dr. Goslee said that his paper is pessimistic. It is pessimistic language from an optimistic brain. Its effect will be like applying a hatchet to the dead branches of a tree.

Dr. Goslee is a teacher of prosthesis, and is not satisfied with the conditions he finds, yet he is hoping for better things. He wants to plant seeds which will bear better fruit in the future.

Dr. Taggart spoke about a steel cylinder, but he did not make it clear why this piece of steel was so beautiful. It was not wonderful because it had the high polish, but because it was so perfect in all parts that it could receive this high polish. The fault of our inlay system is that we have not dared to polish our inlays for fear of exposing defects. I have seen Dr. Taggart's inlays. They are as artistically perfect as that piece of steel. This is a prosthetic method of doing what an operative dentist never has produced: a perfectly solid gold filling. This is an optimistic thought for Dr. Goslee to take back with him. Men must go into their laboratories more in order to do better work in their offices. Our aim heretofore has been how much we could get out of it instead of how well we could do the work. Our porcelain bridges in the past have been built on very slight foundations. Dr. Goslee has taught us regarding their construction. There are definite laws of dynamics in bridge-work. They may be made both too strong or too weak. There is a field for study.

(In the absence of the regular stenographer the above report was taken in shorthand by Dr. Voelker, one of the members, but unfortunately at this point his paper gave out, and we are unable to give a report of the remarks made by Drs. Tracy and Goldsmith of New York, and the closing discussion by Dr. Goslee.)





Revising Dental Statutes.

Periodically we hear a demand for unification of dental statutes, but no concerted effort toward this end has apparently been seriously undertaken. The need of unification grows out of the fact that there are scarcely two State dental laws that bear any close resemblance with one another. If all the laws of all the States could be collected, and studied, and from this examination if a statute could be framed which would at least cover such requirements as might well be common to all States, we should at least have a fair foundation for unification, even though in other respects the laws might differ to meet local conditions.

For example, the number of examiners which should constitute a board; the manner of their selection and appointment; the duration of their terms of office; methods of examining candidates who have never been in practice; methods of examining practitioners licensed in other States; perhaps the number of examinations per annum: these and other features might well be common to all State dental laws. In regard to educational requirements there would probably for many years necessarily be a difference of opinion and consequently a difference in the laws



would be unavoidable. But even these varying educational standards might well be classified, and become known as Educational Standards, A, B, and C, each State adopting such standards as its lawmakers might decide to be best for its own citizens. In this way even the differences in the laws would become similarities, and, moreover real interchange of license would easily become established between States having identical methods of granting licenses.

But our people seem mad with the notion that each State must be a separate sovereignty, and to this end it almost seems as though special effort is made to couch laws in language as different as possible from that used in similar statutes in other States. All this, of course, tends to defeat the end, which all, nevertheless, admit to be desirable.

**New Law
Proposed in
New Jersey.**

In New Jersey it appears that the existing statute contains certain features which have not proven entirely satisfactory, and a committee was appointed to draft a proper modification of the present law.

This committee undoubtedly labored hard and conscientiously, yet the product was an entirely new statute, which not only totally differs from the law as it stands, but is quite unlike anything to be found in any other State. A unique feature is the creation of a "Dental Council," to include the "Secretary of State, the President of the State Board of Health, the State Superintendent of Public Instruction, the President of the State Dental Society, and the Secretary of the Board of Dental Examiners."

To this Dental Council is relegated the power to grant licenses, to persons recommended to them by a dental examining board after examination, and to dentists holding licenses from other States under stated conditions.

It has been explained that the idea of a Dental Council is copied from the Board of Regents of the State of New York, and this leads us to the point of the present argument. Had this committee really formulated a statute creating a Board of Regents exactly similar to the Regents of the metropolitan State, they would at least have been advocating a step toward unification. But while the New Jersey idea may be a copy of the New York law, the resemblance is very taint. In the first place the New York Regents governs all educational matters,

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whereas the Dental Council herein provided is purely dental in its scope. But the chief dissimilarity lies in the fact that the New York Regents is absolutely non-political, and is composed exclusively of men of high public standing, men, moreover, chosen especially because of their fitness for the work intrusted to them. On the contrary, of the members of the Dental Council, in the proposed Jersey law, there would be but one really chosen for the work, viz.: the secretary of the Board of Dental Examiners. The President of the State Dental Society would likely be a suitable man as would, perhaps, the Superintendent of Public Instruction; but the others would assuredly be men selected for their respective offices regardless of their ability to fill a place in the Dental Council.

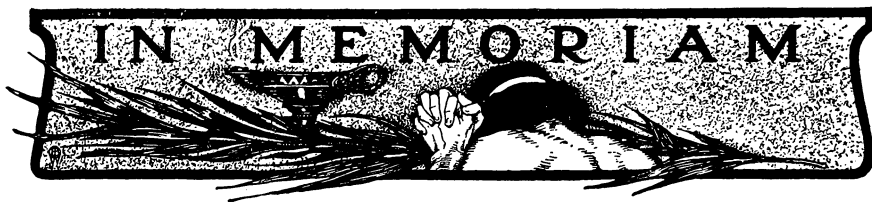
Again, this Dental Council would constantly change its personnel, whereas the Regents of New York is a practically constant body, its members serving so long that efficiency is assured.

The proposed act entirely destroys the present powers of the Dental Examining Board, making of it a body whose single duty would be to examine candidates for license. It is far from certain that this is a bad idea. Such is practically the status of both the dental and the medical boards of examiners in New York. But unless the power withdrawn from the Board of Examiners can be given into the care of a high grade board similar to the Regents of New York, no alteration of present conditions seems logically advantageous.

Cocaine Formula Corrected.

By a mistake in the report of Dr. Vaughan's paper in the last issue, the formula given for a cocaine injection solution is erroneous and would produce a dangerous dose. The following has been supplied by Dr. Vaughan as correct:

Cocaine hydrochloratis	gr. v
Adrenalin chloridi	m xiv
Sodii chloridi	gr. viii
Phenol	m iiss
Aquæ qs. ad	oz. i



Dr. Wm. C. Derby.

Dr. William C. Derby, for 56 years one of the most prominent citizens of Ellenville, N. Y., died at his residence after a short illness. With the exception of two or three periods of sickness in the last few years, Dr. Derby enjoyed robust health through all his years and was always in fine physical condition.

Deceased was a descendant of the Derby family of Orange county. Isaac Derby, his grandfather, was born in the county, and owned a large tract of land within the limits of the city of Newburgh. Of his family of four children, Daniel C., the father of Dr. Derby, was born at Montgomery, May 22, 1799. He spent his youth there and married Miss Julia Carpenter, of Wallkill township, she being of Puritan stock, the first Carpenter having come over in the Mayflower.

Her father and grandfather, both of the name of William, were born in Orange county. Daniel C. and wife settled on a farm in Wallkill township and raised a family of seven children, William C., Mary, who married Dr. Theodore Davenport, John, Abigail, Daniel D., and Kate, who married Henry Knox, of Kansas.

Dr. Derby was born June 6, 1828. He attended school in the district and remained at home until March, 1851, when he came to Ellenville and studied dentistry and soon after started in his profession, which he has practiced continuously since, occupying offices in his own building for 54 years.

On December 28, 1853, he married Elizabeth, daughter of the late Thomas and Mary Smart, of Ellenville. To the union there were born five children, of whom two, Dr. Frank C. Derby, dentist, of New York, and Dr. Harry C. Derby, dentist, of Ellenville, survive, the latter having been, for a number of years, associated with his father in business. Dr. Derby was a genial gentleman, with many friends. He was a lifelong Democrat, taking an active part in party and public affairs. He had been town clerk, trustee and president of the village, and for two terms—1881, 1882—was supervisor of the town. In the purchase of the Terwilliger House from Eli D. Terwilliger, in 1873, he was associated in the ownership with Abram Constable.

Mrs. Derby died on the 15th of October, 1876.

Dr. Derby was a charter member of Wawarsing Lodge, F. and A. M.



Dr. C. S. Reichert.

Charles Scott Reichert was born in Tipton, Iowa, November 30, 1876, son of Mr. and Mrs. J. H. Reichert. He received the training afforded by the public schools of Tipton, graduating from the high school, and for the following two years was in business with the lumber firm of Reichert & Geller.

Then came a year spent in Cedar Rapids business college and at the outbreak of the Spanish War he enlisted as a member of Co. F, 49th Iowa Vol. Infantry. While serving with his regiment in Cuba he was seized with the fever which in the end was the cause of his death. After a third relapse on the island he was given a furlough and came home to be confined to his bed for a number of months. With the return of strength and comparative better health, Mr. Reichert again took up his studies, receiving one year's training at the State University Dental School, and two years at Northwestern Dental School, Chicago, graduating from the last named institution.

Mr. Reichert's stay in Cuba had impressed him with the opportunity for a business opening and he began the practice of his profession in Havana, the first American dentist to be granted a license. After a few weeks of work, however, a second attack of fever compelled his return home, and again he was confined to a sick bed for many months.

From this time on Dr. Reichert has made a brave determined fight for life, periods of health alternating with weeks and months of illness until the end came.

The funeral services were singularly impressive and beautiful and the exceptional floral offering and the attendance of the friends gave evidence of the high regard in which Dr. Reichert was held. The services were in charge of J. Kent Rizer, the music being furnished from the Choral Club through their male quartet.

Company F, 49th Iowa Infantry, attended in a body, one detail acting as pallbearers and a second standing at attention by the casket during the service. Interment was made in the Masonic Cemetery and at the close of the commitment service "taps" were sounded by Bugler Curry.

Mr. Andrew J. Smith.

It is with deep regret that the dentists and the dental trade throughout the country learn of the death of Andrew J. Smith. Mr. Smith passed away after a short illness, on November 11, 1906, at his residence at Providence, R. I.



He was born in Natick, R. I., August 9, 1832. After the usual public school education of his day, he entered upon his apprenticeship as an apothecary, and at the age of 21, set up for himself in the drug business. For years he enjoyed the distinction of being one of the most popular druggists in the city.

Early in his business career, he foresaw the importance of the dental supply business and made it a department of his store.

His business in this department increased so rapidly, that about fifteen years ago, he gave up the drug business and turned his entire attention to the dental trade.

He was always in sympathy with the needs of the dental profession, and many a prosperous dentist has gladly acknowledged his gratitude for the advice and financial aid rendered him at the start by Mr. Smith.

In 1864, he married Mary A., daughter of the late E. P. Knowles, mayor of Providence, by whom he had four children. They, with the widow, survive him. His love of home life was exhibited in a marked degree. He belonged to no secret societies and never sought political preferment. His chief recreation was in outdoor life, yachting, hunting, and fishing. He was a member of the Rhode Island Yacht Club. His disposition at home or abroad was ever sunny and genial, and his demeanor toward his associates was always marked with kindness and cordiality.

His funeral was attended by a large number of prominent dentists and representatives of the dental trade. Six of the leading dentists of the city were pallbearers, and the interment was in Warwick, R. I., in the countryside which he always loved.





SOCIETY ANNOUNCEMENTS

National Society Meetings.

National Association of Dental Examiners,
Minneapolis, Minn., July 26, 27, 28.

National Dental Association, Minneapolis,
Minn., July 30.

Jamestown Dental Convention, Norfolk, Va.,
Sept. 10, 11, 12.

State Society Meetings.

Alabama Dental Association, Birmingham, May 14, 15, 16, 17.

Arkansas State Dental Association, Eureka Springs, May 29, 30, 31

Connecticut State Dental Association, New London, April 16, 17.

Colorado State Dental Society, Colorado Springs, June 20, 21, 22.

Florida State Dental Society, Atlantic Beach, June 6, 7, 8.

Georgia State Dental Society, Atlanta, May 7, 8, 9, 10.

Illinois State Dental Society, Quincy, May 14, 15, 16, 17.

Indiana State Dental Association, Indianapolis, June 11, 12, 13.

Iowa State Dental Society, Cedar Rapids, May 7, 8, 9.

Kentucky State Dental Association, Louisville, May 20, 21, 22.

Maine Dental Society, July 16.

Minnesota State Dental Association, Minneapolis, July 30, Aug. 3.

Mississippi Dental Association, Meridian, May 28, 29, 30.

Montana State Dental Society, Helena, April 12, 13.

Nebraska State Dental Society, Lincoln, May 21, 22, 23.

New Jersey State Dental Society, Asbury Park, July 17, 18, 19.

New York State Dental Society, Albany, May 10, 11.

Oregon State Dental Association, Portland, May 9, 10, 11.

South Carolina State Dental Association, Anderson.

South Dakota Dental Society, Sioux Falls, June 5, 6, 7.

Tennessee State Dental Association, Knoxville, July 9, 10, 11.

Texas State Dental Association, San Antonio, June 13, 14, 15.

Vermont State Dental Society, Burlington, May 15.

Virginia State Dental Association, Jamestown, Sept. 10, 11, 12.

Wisconsin State Dental Society, La Crosse, July 16, 17, 18.



National Dental Association Clinic.

The work of arranging the clinical operations, table clinics, etc., for the coming N. D. A. meeting is progressing. I had hoped that I might at this time publish the names of the District and State Chairmen, but that is impossible. The fearful floods, and the great amount of snow which has fallen have prevented the usual mail facilities. It must be this, for the letters sent December 20, 1906, in many cases, still remain unanswered.

Plans have been made, which, if followed, should result in bringing to the meeting men from all the States in the Union and Canada.

As soon as possible each State will be provided with a local chairman who will make every effort to obtain such an array of talent that the Clinic of the National Dental Association, which is to be held at Minneapolis on July 31 and August 1, will be the best ever arranged for the consideration of the members.

The work of the Clinic has been divided.

Dr. W. N. Murray, Medical Block, Minneapolis, has been appointed chairman of the Inlay Section. Dr. Murray is arranging special features for his department.

Dr. W. R. Clack, of Clear Lake, Iowa, secretary of the Clinic Section, has the territory west of the Mississippi River entirely under his jurisdiction.

I have the rest of the United States and Eastern Canada under my care.

The Executive Council has invited the members and friends of the Black Club to operate on one of the days of the clinic. The invitation will be extended to them, and beyond a doubt it will be accepted.

The fact that I have been chosen Chairman of the Clinic Section, does not mean that the clinic is to be a Black Club Clinic. It simply means this, that I hereby extend a most cordial invitation to all reputable dentists in the United States and Canada to come, meet with us, and if you have anything new to introduce in methods of filling teeth, or some new appliance you wish to demonstrate at a table clinic, come to us and be welcome. Every chance will be given all to assist in making this a most memorable clinic. (I am not in position to invite to the Clinic those who have patented instruments or methods to sell, their place is the Exhibit Room.)

I would like every man who has anything which he feels is of value to others to know, that if he will come and demonstrate it, there is room on the programme, and at the meeting for him.

I am depending upon the District and State Chairmen to assist me. One man may do much, but many men who are willing to work and do



work, are able to do much more. I am bending every energy to make this Clinic the best which the National has ever held. More no man is able to do.

The Dental Journals for July will contain the Clinical Programme.

Those who wish their names to appear as operators or table clinicians must have them in my hands by June 1st.

On July 1st, the N. D. A. programme goes to the printer.

E. K. WEDELSTAEDT,
Chairman Clinic Section.

N. Y. Life Building, St. Paul, Minn.
February 14, 1907.

National Association of Dental Faculties.

The annual meeting of the National Association of Dental Faculties will be held in Minneapolis, Minn., commencing at 2 P. M., Friday, July 26, 1907.

The Executive Committee will meet at 10 A. M. the same day. The West Hotel has been selected as headquarters and place of meeting. Hotel rates as published in the notices of the meeting of National Examiners will prevail.

Very truly yours,

H. B. TILESTON,
Chairman Executive Committee.

B. HOLLY SMITH,
Secretary Executive Committee,
1007 Madison Ave., Baltimore, Md.

Indiana State Dental Association.

The Forty-ninth Annual Meeting of the Indiana State Dental Association will be held at the Claypool Hotel, Indianapolis, June 11, 12, 13, 1907. The Executive Committee has arranged an unusually interesting programme for this meeting. A cordial invitation is extended to the profession to be present.

CARL D. LUCAS, Secretary.

Indianapolis.



National Association of Dental Examiners.

The National Association of Dental Examiners will hold their Twenty-fifth Annual Meeting in Minneapolis, Minn., beginning Friday, July 26, and continue through the 27th and 29th.

Accommodations have been secured at the leading hotel of Minneapolis, "The West Hotel." Rates as follows: Room without bath \$1.00 per day for each person occupying the room. Room with bath, \$2.00 per day for one person and \$1.50 per day for each additional person in room. Hotel on European plan. Any room in the hotel capable of accommodating two people. Telephone in each room; hot and cold water. A large attendance of delegates is earnestly requested. Committee on Colleges, Joint Conference Committee, Tabulation of Examining Boards reports, the Committee for promoting a system of credits and uniformity of Examinations will all give exceedingly interesting reports, valuable to all the members of the Association. Railroad rates will be announced later.

For information apply to Charles A. Meeker, D.D.S., secretary and treasurer, 29 Fulton Street, Newark, N. J.

New Jersey State Dental Society.

The Thirty-seventh Annual Meeting of the New Jersey State Dental Society, will be held in the Auditorium at Asbury Park, N. J., commencing 10 A. M., July 17, and continuing through the 18th and 19th. The headquarters will be at the Hotel Columbia with the rates of \$3.50 and \$4.00 per day, and all reservations must be made before July 1st. Prominent dentists have signified their intention of reading papers, and the clinics will all be of a new and novel nature.

Clinic Committee in charge of Charles H. Dilts, D.D.S., Trenton, N. J.

Exhibit Committee in charge of Walter Woolsey, D.D.S., Elizabeth, N. J.

Programmes will be out June 15th. Last year over 800 dentists registered in attendance. The Auditorium where the meeting is held is the largest and best adapted building on the Jersey Coast. Cut off the week of July 15th, and be with us.

CHARLES A. MEEKER, D.D.S., Secretary.

29 Fulton Street, Newark, N. J.



New Jersey State Board of Registration and Examination in Dentistry.

The New Jersey State Board of Registration and Examination will hold its Semi-annual Meeting beginning Monday, July 8, 9, 10, and 11, in the Assembly Chamber of the State House at Trenton, N. J.

For information kindly apply to the secretary.

A photograph of the applicant must be filed with the application.

Practical and theoretical work completed at the session.

CHARLES A. MEEKER, D.D.S.,

Secretary of Dental Commission.

29 Fulton Street, Newark, N. J.

The New York Prosthetic Dental Society.

The First Annual meeting of this Society will be held on Monday and Tuesday, April 22 and 23, at the Murray Hill Lyceum, 34th St., New York City.

Exhibits, 1 P. M. to 10 P. M., both days. Clinics, 7.30 P. M. to 10 P. M., both days.

In addition to invitations sent to the dental societies, 2,500 programmes will be sent to dentists in Greater New York and vicinity, and with the night clinics and exhibits, a large attendance is assured.

We are arranging an excellent programme and will spare no effort or expense to make this affair successful.

L. J. WEINSTEIN, Secretary.

212 E. Broadway, New York City.

Fifth District Dental Society of the State of New York.

The Thirty-ninth Annual Meeting of the Fifth District Dental Society of the State of New York will be held at the Yates Hotel, Syracuse, N. Y., April 9 and 10.

C. A. SAYERS, Recording Secretary.



Southern Wisconsin Dental Association.

The Thirteenth Annual Meeting of the Southern Wisconsin Dental Association will be held at Lancaster, Wis., May 21, 22, 23. All reputable practitioners are cordially invited.

Clinton, Wis.

C. W. COLLVE, Secretary.

Mississippi Dental Association.

The Fourteenth Annual Meeting of the Mississippi Dental Association will meet in the County Court House, in Meridian, May 28, 29, 30. All ethical practitioners of this and other States are cordially invited to attend.

Reduced rates for railroad and hotel accommodations will be secured. For full particulars, address

E. DOUGLAS HEAD,
Secretary Miss. Dental Association,
Tupelo, Miss.

Kentucky State Dental Association.

The next annual meeting of the Kentucky State Dental Association will convene at Louisville, Ky., May 20, 21, 22, 1907. We anticipate a most interesting and profitable meeting. A cordial invitation is extended to the profession.

W. M. RANDALL, Secretary.

Cor. Brook and Broadway.

Nebraska State Dental Society.

The Thirty-first Annual Meeting of the Nebraska State Dental Society will be held in Lincoln, May 21, 22, 23, 1906, at the Lincoln Dental College.

M. G. VANCE, Secretary.



Georgia State Dental Society.

The Thirty-ninth Annual Meeting of the Georgia State Dental Society will be held in Atlanta, Ga., May 7, 8, 9, 10, 1907.

All ethical practitioners are cordially invited to attend.

D. H. McNEILL, Cor. Secretary,
Athens.

WM. GREENSHAW, President,
Atlanta.

Alabama Dental Association.

The next Annual Meeting of the Alabama Dental Association will be held in Birmingham, beginning on the second Tuesday in May, 1907, and continuing four days. All ethical dentists are invited to attend. Reduced rates on all railroads on certificate plan.

F. A. JOHNSTON, Secretary.

Sheffield, Ala.

Southern Nebraska Dental Society.

The Southern Nebraska Dental Society met in Superior, February 13th, and the meeting was very successful. Dr. Clyde Davis, Dean of the Lincoln Dental College, was with us and gave us very beneficial clinics, both chair and table, in enamel fillings. Cavity preparation was also discussed. A business meeting will be held in Lincoln during the State meeting to be held May 22, at 3 P. M., at Tindall Hotel.

W. A. McHENRY.

Illinois State Dental Society.

The Forty-third Annual Meeting of the Illinois State Dental Society will be held in Quincy, May 14, 15, 16, 17.

A. D. BLACK, Secretary.



Connecticut State Dental Association.

The Forty-third Annual Convention of the Connecticut State Dental Association, will be held at New London, Conn., Tuesday and Wednesday, April 16, 17, 1907. Essays will be presented by Dr. F. B. Noyes, Chicago, "The Structure of Enamel with Reference to Cavity Preparation." Dr. H. C. Ferris, Brooklyn, N. Y., "Antiseptic Sprays and Their Physiological Action." Dr. G. M. Griswold, Hartford, Conn., "Burnished Fillings." Dr. E. Whitford, Westerly, R. I., "Our Old Standby." Dr. A. J. Flannagan, Springfield, Mass., "Comparisons Are Odious." Dr. F. S. Belyea, Brookline, Mass., "The Artistic Arrangement of Teeth."

E. S. ROSENBLUTH, Secretary.

Nebraska Board of Dental Examiners.

The next meeting of the Nebraska Board of Dental Examiners will be held at the State House in Lincoln, Neb., May 29, 30, 31, 1907. All applicants for examination must have their applications in the hands of the Secretary five days before this date. For further information, address,

DR. C. F. LADD, Secretary.

1241 O Street, Lincoln, Neb.

Alumni Clinic of the St. Louis Dental College.

The Alumni Association of the St. Louis Dental College (formerly Marion-Sims) wish to announce that their Annual Clinic will be held at the college building, Grand Avenue and Caroline Street, on Tuesday and Wednesday, May 7 and 8, 1907.

All ethical members of the profession are cordially invited to come and enjoy the festival of good things being prepared, and every member of the Alumni is especially requested to show his allegiance to the Association by his presence.

Respectfully,

JOHN BERNARD O'BRIEN,

W. L. O'NEILL,

Committee on Publicity.



Alumni Association of Washington University Dental Department.

The Annual Meeting of the Alumni Association of Washington University Dental Department (Missouri Dental College) will be held May 20, 21, at the College Building, 2645 Locust Street, St. Louis, Mo. A number of prominent essayists and clinicians have been secured, and an interesting and instructive programme will be presented. Adequate space has been secured for the various manufacturers exhibits. This will be a noteworthy feature of the meeting. All ethical practitioners invited. Executive Committee—Dr. A. J. Prosser, Chairman; Dr. F. W. Horstman; Dr. Chas. Herbert.

Dental Department of the University of Maryland—Class of 1895.

There will be a reunion of the class at the University during the University Centennial, May 30 and 31, June 1 and 2. All members are asked to write Dr. E. H. Markley, Gettysburg, Pa., for further information at once.

Lake Erie Dental Association.

The Forty-fourth Annual Meeting of the Lake Erie Dental Association will be held at Hotel Rider, Cambridge Springs, Pa., on May 21, 22, 23. Upon our programme this year are men of exceptional merit, and we are pleased to invite all reputable dentists and their friends to this beautiful place for convention purposes.

Warren, Pa.

V. H. McALPIN, Secretary.

Eastern Indiana Dental Association.

The Eastern Indiana Dental Association meets in Anderson, Indiana, May 14 and 15. Good clinics. Good papers. Everybody invited. Everybody who comes is a member.

C. W. ORLAND.

